UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

CASE NO. 1:16-CV-21199-CMA/O'Sullivan

ANDREA ROSSI, *et al.*,

Plaintiffs,

v.

THOMAS DARDEN, *et al.*,

Defendants,
______________________________________/

PLAINTIFFS' *DAUBERT* MOTION TO STRIKE AND EXCLUDE DEFENDANTS' EXPERTS

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INTRODUCTION

Defendants failed to provide a written report in compliance with the requirements of Fed. R. Civ. P. 26(a)(2)(B), and therefore the Expert Disclosure of Joseph A. Murray ("Murray Disclosure") should be stricken, and he should be excluded from testifying as an expert witness in this matter. Further, both of Defendants' purported experts – Joseph A. Murray ("Murray") and Rick A. Smith ("Smith") – should be excluded from testifying as expert witnesses because their opinions fail to meet *Daubert* standards.

STATEMENT OF FACTS

Procedure.

The Court's Order Setting Trial and Pre-Trial Schedule, Requiring Mediation, and Referring Certain Matters to Magistrate Judge [ECF No. 23] ("Scheduling Order") sets the following deadlines:

- to exchange expert written summaries or reports by January 30, 2017;
- to complete all discovery, including expert discovery, by February 27, 2017; and
- to file all pre-trial motions and *Daubert* motions, including motions to strike experts by March 21, 2017.

On January 30, 2017, at 11:54 PM, Defendants served the Murray Disclosure (Murray is the "former Vice President of Engineering" for Defendant Industrial Heat, LLC) (see Murray Report p. 1) and an Expert Report of Rick A. Smith, P.E. A copy of each of the foregoing is attached hereto as Exhibits "A" and "B", respectively. The Defendants subsequently provided "supplemental documents to disclosure of Joe Murray" after the close of business on February 16, 2017, more than two (2) weeks after the disclosure deadline, and the night before Mr. Murray's deposition was to take place in North Carolina[1]. Because of such late service, the undersigned did not have the opportunity to review such "supplemental documents" before Mr. Murray's deposition. Such "supplemental documents" consisted of various graphs and video simulations created by Mr. Murray.

The Murray Disclosure includes one sentence setting forth the "qualifications" of Mr. Murray; simply that "Mr. Murray's educational background includes an ABD [all but dissertation] from University of Maryland, an M.S. from University of Utah and a B.S. from

[1] Murray's deposition had been noticed on December 14, 2016.

Michigan State University." (*Id.* at 3.) The disclosure fails to include a resume and/or curriculum vitae for Mr. Murray, and otherwise fails to include any supporting data and/or methodology used by Mr. Murray. Despite multiple requests by Plaintiffs' counsel, including formal requests for production, Mr. Murray has yet to provide any resume and/or curriculum vitae to date.

Substance.

The Murray Disclosure (Exhibit "A" hereto) sets forth four (4) areas in which Mr. Murray intends to testify:

(1) that the power reportedly absorbed during the testing of the E-Cat is at odds with the amount of power used at the plant (Murray Report p. 1);

(2) that there is no logical reason why the Coefficient of Performance ("COP") should be changing inversely to the amount of power inputted (*id.* at 2);

(3) that the room inside the plant would have been heated to a temperature unsuited for a human working environment (*id.*); and

(4) that the water meter used by the Expert Responsible for Validation ("ERV") would report a much higher flow of water than was actually occurring (*id.* at 3).

The Expert Report of Rick A. Smith (Exhibit "B" hereto) provides that Mr. Smith will be testifying as to three (3) conclusions:

(1) that the ERV's reports are not valid to tabulate and compute the performance of the E-Cat (Smith Report p. 21);

(2) that the E-Cat test was not properly instrumented and there was no measurement of the E-Cat's actual output (*id.*); and

(3) that, by process of elimination, the claimed energy never existed because it must have been rejected somewhere. (*id.*).

Mr. Smith indicated in deposition that he may testify as to additional conclusions not set forth in the report. [2]

Mr. Smith's Report was written with the caveat that Mr. Smith had "not yet been able to inspect the E-Cat site in Florida." Instead, the report was written based only "upon information currently available." (*Id.* at 1.)

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[2] During his deposition, Mr. Smith testified that he planned on testifying to matters which had not been disclosed prior to his deposition nor are they contained within his report. Such additional matters shall be addressed below.

STANDARD

"Rule 702 [of the Federal Rules of Evidence] requires district courts to ensure 'that the expert's testimony rests on a reliable foundation and is relevant to the task at hand." *In re Denture Cream Prods. Liab. Litig.*, 795 F. Supp. 2d 1345 (S.D. Fla. 2011) (quoting *Daubert*, 509 U.S. at 597). "This 'gatekeeping' function must be performed with regard to the admissibility of both expert scientific evidence and expert technical evidence." *Id.* (quoting *United States v. Frazier*, 387 F.3d 1244, 1260 (11th Cir. 2004)). In determining admissibility, the district courts consider whether: "(1) the expert is qualified to testify competently regarding the matters he intends to address; (2) the methodology by which the expert reaches his conclusions is sufficiently reliable as determined by the sort of inquiry mandated in Daubert; and (3) the testimony assists the trier of fact, through the applications of scientific, technical, or specialized expertise, to understand the evidence or to determine a fact in issue." *Id.*

With respect to the second prong above, "District courts have substantial discretion in deciding how to test an expert's reliability." *United Food Mart, Inc. v. Motiva Enters., LLC*, 404 F. Supp. 2d 1344, (S.D. Fla. 2005) . *"Daubert instructs* courts to consider the following factors: (1) whether the expert's theory can be and has been tested; (2) whether the theory has been subjected to peer review and publication; (3) the known or potential rate of error of the particular scientific technique; and (4) whether the technique is generally accepted in the scientific community." *Id.* (Emphasis supplied). "[W]hile the inquiry is 'a flexible one,' *the focus 'must be solely on principles and methodology, not on the conclusions that they generate*.'" *In re Denture Cream Prods. Liab. Litig.*, 795 F. Supp. 2d 1345 (S.D. Fla. 2011) (Emphasis supplied). "[N]othing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the ipse dixit of the expert." *Id.*; *Gastaldi v. Sunvest Resort Cmtys., LC*, 709 F. Supp. 2d 1299 (S.D. Fla. 2010). "Rather, the trial court is free to 'conclude that there is simply too great an analytical gap between the data and the opinion proffered.'" *In re Denture Cream*, 795 F. Supp. 2d at 1350.

I. Defendants Failure to Abide by Fed R. Civ. P. 26(a)(2)(B) Necessitates Striking the Murray Disclosure

Fed. R. Civ. P. 26(a)(2)(B) provides a party's disclosure of a witness whom may be offered to provide expert testimony must be accompanied by a written report containing:

(i) a complete statement of all opinions the witness will express and the basis and reasons for them;
(ii) the facts or data considered by the witness in forming them;
(iii) any exhibits that will be used to summarize or support them;
(iv) the witness's qualifications, including a list of all publications authored in the previous 10 years;
(v) a list of all other cases in which, during the previous 4 years, the witness testified as an expert at trial or by deposition; and
(vi) a statement of the compensation to be paid for the study and testimony in the case.

See Fed. R. Civ. P. 26(a)(2)(B).

Notwithstanding the requirements of Fed. R. Civ. P. 26(a)(2)(B), Defendants failed to provide any written report prepared by Mr. Murray on or before January 30, 2017, as required by this Court's Scheduling Order, or any time thereafter. In fact, at his deposition, Mr. Murray not only testified that he had prepared a report, but also that he would have to refer to his report to be able to answer some of the questions asked. (See Murray Trans. 224: 10-22; 227: 2-16). Mr. Murray was ultimately unable to answer several questions as he did not bring his report with him to the deposition. *See Id.* As a result of Defendants' failure to provide Plaintiffs with a copy of Mr. Murray's report, Plaintiffs were unable to prepare for effective cross examination of Mr. Murray at deposition. "Rule 26(a)'s expert disclosure requirement is intended to provide opposing parties reasonable opportunity to prepare for effective cross examination and perhaps arrange for expert testimony from other witnesses." *Access 4 All, Inc. v. Bamco VI, Inc.,* 2012 U.S. Dist. LEXIS 190940, *3 (S.D. Fla. Jan. 6, 2012)(internal quotations omitted).

The "Eleventh Circuit recognizes that "[b]ecause the expert witness discovery rules are designed to allow both sides in a case to prepare adequately and to prevent surprise, … compliance with the requirements of Rule 26 is not merely aspirational." *Managed Care Solutions, Inc. v. Essent Healthcare, Inc.*, 2010 U.S. Dist. LEXIS 54148, 2010 WL 1837724 (S.D. Fla. May 3, 2010) (quoting *Cooper v. Southern Co.*, 390 F.3d 695, 728 (11th Cir. 2004), overruled on other grounds by *Ash v. Tyson Foods, Inc.*, 546 U.S. 454 (2006)). In *Managed Care Solutions*, Judge O'Sullivan held that the failure to disclose an expert's qualifications is harmful and prejudicial where the discovery deadline has passed and where the deadline for dispositive motions is imminent. *Id.* The Court further stated that "[t]he purpose of the expert witness disclosure requirements is thwarted by the partial expert disclosure in that whatever opinions and/or testimony that would be given" will necessarily be a surprise to the opposing party(ies), who have been "deprived of the opportunity to determine whether rebuttal experts are necessary" and "deprived of the opportunity to investigate the qualifications" of the expert as well as the bases for his opinion. *Id.* Such prejudice exists in this case. Plaintiffs were deprived of the opportunity to investigate Mr. Murray's qualifications and any basis for his opinions as well as the opportunity to determine whether a rebuttal witness would be necessary based upon such opinions. In *Managed Care Solutions*, Judge O'Sullivan granted the Motion to Strike Expert Disclosures, and the same result is justified here. *See Id.*

Moreover, the Murray Disclosure fails to include the requisite information set forth in Rule 26(a)(2)(B) including, but not limited to (a) the basis and reasons for each of Mr. Murray's opinions; (b) the facts or data considered by the witness in forming them; (c) any exhibits that will be used to summarize or support them; (d) the witness's qualifications, including a list of all publications authored in the previous 10 years; or (e) statement of the compensation to be paid for the study and testimony in the case. Additionally, the document was neither prepared nor signed by Mr. Murray. (See Murray Trans. 243: 9-19). Accordingly, the Murray Disclosure is insufficient to replace the requisite expert report. Defendants' failure to provide such required information has been further exacerbated by failing to produce such information in discovery. Specifically, Plaintiffs requested:

a. "Industrial Heat, LLC's entire employment file for Joseph Murray" in Plaintiff, ANDREA ROSSI's, First Request for Production to Defendant, INDUSTRIAL HEAT, LLC, served on August 26, 2016; and

b. The entire personnel file for Joseph Murray" in Plaintiff, ANDREA ROSSI's, Second Request for Production to Defendant INDUSTRIAL HEAT, LLC, served on August 29, 2016.

On February 10, 2017, INDUSTRIAL HEAT, LLC served its Supplement to its Amended Responses and Objections to Plaintiff ANDREA ROSSI's Second Request for Production. There, INDUSTRIAL HEAT, LLC indicated that it "will conduct a reasonable search for and produce any resume or CVs of Joseph Murray…." Notwithstanding the foregoing, to date, the Defendants have failed to provide any such resume and/or *Curriculum Vitae.* The law is clear, "[i]f a party fails to disclose the identity of a witness pursuant to Rule 26(a), the party is not allowed to use that information or witness to supply evidence on a motion, at a hearing, or at trial, unless the failure was substantially justified or is harmless." *Managed Care Solutions* at 9.

"The sanction of exclusion is automatic and mandatory unless the sanctioned party can show that its violation of Rule 26(a) was either justified or harmless." *Valdes v. Miami-Dade Cnty.*, 2015 U.S. Dist. LEXIS 151024, *11-12, 2015 WL 6829055 (S.D. Fla. Nov. 6, 2015). Here, Defendants' failure was neither justified nor harmless. Accordingly, the Murray Disclosure should be stricken, and Mr. Murray's testimony excluded for failure to satisfy the requirements set forth in Fed. R. Civ. P. 26(a)(2)(B).

II. Defendants Failure to Abide by Fed R. Civ. P. 26(a)(2)(B) Necessitates Striking the Supplemental Expert Report of Rick A. Smith, P.E. and Excluding Related Testimony

During the deposition of Mr. Rick A. Smith on February 27, 2017, Mr. Smith disclosed that in addition to those matters set forth in his report, he had formed another opinion not previously disclosed that "the E-cat never produced superheated steam." (Smith Trans. 126: 2-9). Thereafter, on March 20, 2017 at 8:47 p.m, the day before the original deadline to file dispositive motions and nearly two months after the deadline to make expert disclosures pursuant to Rule 26(a)(2)(B), Defendants' served their Supplemental Expert Report of Rick A. Smith, P.E ("Smith's Supplemental Report") upon Plaintiffs. Smith's thirty (30) page Supplemental Report includes, *inter alia*, six (6) additional conclusions not previously disclosed including that:

(1) There was no steam flow from the E-Cat;

(2) There is no physical evidence of a heat exchanger and cooling fans;

(3) The data reported by Fabio Penon "must be viewed with extreme skepticism";

(4) The produced energy numbers in Penon's report are incorrected and, therefore, his entire report is invalid;

(5) Any steam flow numbers in the Penon report are fictitious and the whole report must be invalidated;

(6) Penon's steam temperature numbers are not valid and, therefore, the whole report is invalid.

Due to the fact that Mr. Smith's failed to disclose his fourth opinion (stated above) until the day of his deposition and because Smith's Supplemental Report was served the day prior to the dispositive motion deadline (and well after the discovery and expert disclosure deadlines), the Plaintiffs have been deprived of the opportunity to (a) investigate these new conclusions; (b) determine whether a rebuttal expert is necessary; (c) depose Mr. Smith regarding such matters; and/or (d) adequately address the conclusions in this Motion. Plaintiffs are substantially prejudiced by this untimely disclosure as it is unable to evaluate such new opinions in light of the pending Summary Judgment and Daubert motion deadlines. "The sanction of exclusion is automatic and mandatory unless the sanctioned party can show that its violation of Rule 26(a) was either justified or harmless." *Valdes v. Miami-Dade Cnty.*, 2015 U.S. Dist. LEXIS 151024, *11-12, 2015 WL 6829055 (S.D. Fla. Nov. 6, 2015).

III. Mr. Murray's Testimony Fails to Satisfy the *Daubert* Standard

As stated above, according to the Murray Disclosure, Mr. Murray intends to offer testimony regarding (a) his comparison of the power sold by Florida Power and Light Company ("FP&L") to the power absorbed by the plant; (b) the inverse relationship of power input to the E-Cat plant to and the coefficient of power; (c) the heat simulations he conducted; and (d) the tests he conducted regarding water flow. *See Exhibit "A"* hereto. For each such opinion, the Court must apply the Daubert standard set forth above.

A. Murray's Comparison Between FP&L and Energy Absorbed By the E-Cat

Plaintiffs request this Court exclude all of Mr. Murray's testimony and any report or disclosure relating to Mr. Murray's comparison between power reportedly sold by FP&L and the power reported by Penon and Fabiani respectively as absorbed by the E-cat including, but not limited to, the graphs affixed to the Murray Disclosure. As a preliminary matter, the conclusions drawn by Mr. Murray with respect to this issue are not relevant evidence which would otherwise be admissible in this case. Secondly, Mr. Murray's testimony and conclusions are unreliable in that (a) the data relied upon by Mr. Murray was both insufficient and of questionable accuracy, (2) such testimony and conclusions are not the product of reliable principals and methods, nor are they likely to assist the trier of fact to understand the evidence or to determine a fact that is at issue in this case.

"To be admissible, expert testimony must "assist the trier of fact to understand the evidence or to determine a fact in issue . . . ." *United States v. Masferrer*, 367 F. Supp. 2d 1365, 1373, 2005 U.S. Dist. LEXIS 7580, *20, 18 Fla. L. Weekly Fed. D 482 (S.D. Fla. 2005). As evidenced by the pleadings in this matter, the issue of whether Penon and Fabiani's data was consistent with the data provided by FP&L is not relevant to any of the underlying claims. The underlying contract, upon which Plaintiffs base their breach of contract claim, provides in relevant part, that the E-Cat must meet certain performance standards as determined by an independent Expert Responsible for Validation ("ERV"). *See* License Agreement Sections 4 & 5. Dr. Fabio Penon was selected by the parties as the ERV. *See* IH-00089766. Accordingly, Dr. Penon's measurements are the sole and only measurements which are relevant to the issues raised in Plaintiffs case.

In their Fourth Amended Counterclaim, Defendants allege that Penon's measurements and/or data had been manipulated. *See* Countercl. ¶¶ *89-91*.. Plaintiffs acknowledge that if Mr. Murray were opining that some type of manipulation had occurred, then perhaps his testimony could have satisfied this prong of the *Daubert* standard, but that is not the case. Mr. Murray's "conclusion" was merely that the FP&L data was "at odds" with the data recorded by Dr. Penon and Mr. Fabiani respectively. *See* Exhibit "A." In fact, Mr. Murray expressly testified that he had no reason to believe that either Dr. Penon or Mr. Fabiani had done anything to manipulate the results of the test. (Murray Trans. 252: 8-10; *see also* 340: 4-9). Accordingly, Mr. Murray's testimony on this matter is not relevant to the matters at issue in this case and is therefore inadmissible.

As to the second issue raised above, Mr. Murray's testimony fails to satisfy the reliability prong of the *Daubert* test. "Rulings on admissibility under *Daubert* inherently require the trial court to conduct an exacting analysis of the proffered expert's methodology."*McCorvey v. Baxter Healthcare Corp.*, 298 F.3d 1253, 1256 (11th Cir.2002). The "[f]actors to ascertain reliability are "(1) whether the expert's methodology can be tested; (2) whether the expert's scientific technique has been subjected to peer review and publication; (3) whether the method has a known rate of error; [and] (4) whether the technique is generally accepted by the scientific community." *Valencia v. Sanborn Mfg. Co.*, 2005 U.S. Dist. LEXIS 47653, *17, 2005 WL 5957819 (S.D. Fla. Aug. 10, 2005) To arrive at his first conclusion, that "the data generated by Fabio Penon ("Penon") and Fulvio Fabiani ("Fabiani") pertaining to the power absorbed during the testing of the E-Cat plant… is at odds with the amount of power used at Doral location," Mr. Murray simply compared the two sets of test data with the FP&L power usage report. (Murray Report p. 1.) Specifically, Mr. Murray had Dr. Penon and Fabiani's test data input into a computer analysis software and then he visually compared the graphs generated by such software to the data from FP&L." (See Murray Trans. 250: 5 to 251: 6). Mr. Murray's opinion was based solely upon his review and analysis of the graphs prepared by Industrial Heat as Mr. Murray testified that he did not apply any scientific, technical and/or other specialized methodology to arrive at his conclusions. (See Murray Trans. 259: 8-16). Furthermore, Mr. Murray offers no opinion and/or explanation as to why or how the different data sets are at odds, nor does Mr. Murray provide any scientific or technical application to explain such alleged difference between the data sets. (See Murray Trans. 282: 16 to 283: 6).

Notably, the test data underlying the graphic illustrations upon which Mr. Murray allegedly analyzed was mostly transcribed into the "analytical software" by hand by Industrial Heat, LLC's employees. (See Murray Trans. 248: 1 to 249: 20). When asked whether there could have been any mistakes and/or typos in the data input by the Industrial Heat employees, Mr. Murray testified that he did not know. (See Murray Trans. 249: 16-18).[3]

"[T]he trial court's gatekeeping function requires more than simply 'taking the expert's word for it.'" *McClain v. Metabolife Int'l, Inc.*, 401 F.3d 1233 (11th Cir. Ala. 2005); *see also Battle v. Gold Kist, Inc.*, 2008 U.S. Dist. LEXIS 102316 (M.D. Fla. Sept. 2, 2008) ("Reliability cannot be established by the mere ipse dixit of an expert."). "If admissibility could be established merely by the ipse dixit of an admittedly qualified expert, the reliability prong would be, for all practical purposes, subsumed by the qualification prong." *United States v. Frazier*, 387 F.3d 1244 (11th Cir.Ga. 2004). Absent a recognized and replicable methodology, theory, or technique, Mr. Murray's *ipse dixit* analysis of the computer generated graphs fails to satisfy the reliability prong of the Daubert test. *See Valencia v. Sanborn Mfg. Co.*, 2005 U.S. Dist. LEXIS 47653, *10-11, 2005 WL 5957819 (S.D. Fla. Aug. 10, 2005) .

Lastly, Mr. Murray's testimony is not likely to assist the trier of fact, through the application of scientific, technical or specialized expertise, to understand the evidence or to determine a fact at issue in this case. *See City of Tuscaloosa v. Harcros Chemicals, Inc.*, 158 F.3d 548, 562 (11th Cir. 1998). Even if it were relevant to the matters at issue in this case, Mr. Murray's "opinion" that the FP&L data is "at odds" with the Penon data and the Fabiani data, without more, fails to assist the trier of fact to understand the evidence or determine a fact in issue as it fails to provide any explanation or opinion as to why such alleged inconsistency exists.

[3] Despite the obvious concern with having a party's employees preparing the data input, Defendants never produced such underlying data allegedly input into the "analytical software" despite a clear responsibility to do so in accordance with Fed. R. Civ. P. Rule 26(a)(2)(B). As such, Plaintiffs have been deprived the opportunity to determine the accuracy or reliability of the same.

Simply put, any juror can compare the data sets with one another and determine if they are consistent and Mr. Murray offers no specialized or scientific explanation as to why any such inconsistencies may exist or how the alleged inconsistency explains any matter in dispute in this case. Expert testimony is not admissible, relevant or helpful if it is not beyond the understanding of the average lay person. *Geter v. Galardi South Enters.*, 2015 U.S. Dist. LEXIS 59927 (S.D. Fla. May 7, 2015).

For the reasons set forth above, Defendants testimony with respect to his comparison of the FP&L records with the Penon and Fabiani records are properly excluded under Daubert.

B. Inverse Relationship of Power Input and Coefficient of Power

Pursuant to the Murray Disclosure, Mr. Murray intends to testify that "there is no logical reason why the COP should be changing inversely to the amount of power inputted…" To arrive at such conclusion, Mr. Murray "compared the reported power input to the E-cat plant reported by Penon against the reported coefficient of power ("COP") reported by Penon. When ask what theory and/or methodology he applied to form his opinion, Mr. Murray testified that "the methodology was to review the data provided, analyze it, and to look at the, the time history of the energy absorption provided by Mr. Penon and Mr. Fabiani." (Murray Trans. 301: 17 to 302: 3). Moreover, Mr. Murray testified that he did not rely upon any written documents or theories in arriving at his conclusion, and that he was unaware of any publications that would support his views with respect to the aforementioned opinion. (Murray Trans. 300: 24 to 301: 7).

As with Mr. Murray's first opinion, Mr. Murray's testimony regarding the above matters fails to satisfy the reliability element of the *Daubert* test. Assuming, arguendo, that Mr. Murray is qualified to opine as to the relationship between the "coefficient of power" and the power absorbed by the E-cat, Mr. Murray fails to identify any reasonable or accepted methodology, theory and/or scientific approach to support his mere conclusory claim that "there is no logical reason why COP should be changing inversely to the amount of power inputted." *Id.* "In *Daubert*, the Supreme Court suggested a non-exhaustive list of several factors to consider in determining if a specific methodology is reliable under Rule 702: whether the methodology can and has been tested; whether the methodology has been subjected to peer review and publication; the known or potential rate of error and the existence and maintenance of standards controlling operation of the methodology; and whether the methodology has gained general acceptance in the scientific community." *In re Denture Cream Prods. Liab. Litig.*, 795 F. Supp. 2d 1345, 1349, 2011 U.S. Dist. LEXIS 65550, *25, 85 Fed. R. Evid. Serv. (Callaghan) 681, CCH Prod. Liab. Rep. P18,924 (S.D. Fla. 2011). It is clear that the methodology applied by Mr. Murray, described as "review the data, analyze it, and look at the, the time history of the energy absorption provided by Mr. Penon and Mr. Fabiani," was purely subjective and is solely connected to the data reported by Penon and Fabiani by the *ipse dixit* of Mr. Murray. (*See* Murray Trans. 301: 17 to 302: 3). "Nothing in either ***Daubert*** or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert." Cordoves v. Miami-Dade County, 104 F. Supp. 3d 1350, 1360, 2015 U.S. Dist. LEXIS 63067, *16 (S.D. Fla. 2015).

Furthermore, as with Mr. Murray's first opinion, Mr. Murray's opinion regarding the inverse relationship between power input to the Plant and the Coefficient of Power does not "assist the trier of fact to understand the evidence or to determine a fact in issue . . . ." United States v. Masferrer, 367 F. Supp. 2d at 1373 (S.D. Fla. 2005). As discussed above, the sole issues before the Court with respect to the results of the Guaranteed Performance test are (1) whether the Expert Responsible for Validation ("ERV") determine that the E-cat met or exceeded the performance standards set forth in the agreement,[4] and (2) whether any of the Defendants manipulated the results of the Guaranteed Performance Test performed by the ERV. Accordingly, Mr. Murray's conclusion does not lend technical, scientific or specialized knowledge that could assist the trier of fact with either issue. Even if the inverse relationship between COP and energy absorbed by the plant were somehow instructive as to the matters at issue in this case (it is not), Mr. Murray's opinion is simply that he has no explanation as to why such relationship is inverse. (See Murray Disclosure). For the reasons set forth above, Mr. Murray's second conclusion fails to satisfy the reliability prong of the *Daubert* test and does not otherwise assist the trier of fact in determining any matter at issue in this case.

[4] Notably, the License Agreement does not provide for any manner in which to contest, challenge, or appeal the ERV's test results. To permit any other expert to opine as to the results or the operation of the E-Cat during the Guaranteed Performance Period undermines the plain language of the License Agreement. Had the parties desired multiple experts to opine as to the test and its results, as opposed to one ERV selected as a neutral arbiter of the test, they could have contracted accordingly.

C. <u>Heat Simulations and Water Flow Testing:</u>

Lastly, the Murray Disclosure discloses two additional areas of expected testimony[5] labeled as "Heat Simulations" and "Water Flow." (*See* Murray Disclosure). Specifically, Defendants state that "Mr. Murray will testify as to the heat simulations he ran to recreate thermal conditions inside the Doral Location" and that "the room would have been heated to a temperature unsuited for a human working environment." *Id.* Notwithstanding the fact that the Murray Disclosure instructs the reader to "*See Thermal Simulations,"* no such simulations were provided by Mr. Murray. Similarly, the disclosure provides that "Mr. Murray will be testifying as to the tests he conducted on the water flow into the E-cat plant" and what such water flow test purportedly showed. *Id.* Mr. Murray testified that he was able to opine, based upon his water flow testing, "that the flow meter was improperly sized and it was operated below its minimum operating point." As with the alleged heat simulations, Mr. Murray's expert disclosure instructs the reader to "*See Water Flow Test Results,"* but again, no such results were produced.

As a preliminary matter, neither the "heat simulations" nor the "water flow tests" would serve to assist the trier of fact to understand any matter at issue in this case, or to understand any evidence which may be relevant in this matter. *See Daubert,* Supra. While Defendants have sought to identify what they perceive to be flaws in the testing protocol and measurement devices, the propriety and/or reliability of the protocol and devices are not at issue in this case.[6] To the extent Defendants seek to offer such testimony to infer that there was some type of manipulation or other nefarious activities taken on behalf of the Plaintiffs and/or Third-Party Defendants, Mr. Murray expressly states that he does not draw that conclusion. (Murray Trans. 340: 4-12). In summary, Mr. Murray testified that he believed the problems with the Penon test data were "a combination of poor test plan, poor documentation, and a completely inadequate selection of the sensors used for this system," none of which constitutes a breach of the License Agreement or would lend support to any cause of action or defense asserted by Defendants in this matter.

[5] While listed in the "Summary of Opinions" section of the Disclosure, these sections do not disclose opinions, but rather reflect observations made by Mr. Murray during simulations and/or tests prepared by Mr. Murray.

[6] Pursuant to the License Agreement, the ERV was solely responsible for validation of the Guaranteed Performance Test. The propriety and/or accuracy of the measurement equipment or test protocol are not at issue in this case. Any objection to the test plan or measurement equipment used has been waived as Defendants failed to raise such matters before or even during the Guaranteed Performance test.

Further, Plaintiffs have been substantially prejudiced by Defendants' failure to provide Plaintiffs any of the relevant underlying data, test plan, test procedures or other data relevant to the simulations and/or tests carried out by Mr. Murray. In fact, when asked whether the Plaintiffs could properly evaluate his test relating to water flow without being provided the test data, Mr. Murray responded "I don't believe you could." (Murray Trans. 338: 11 to 339:8). Similarly, when asked whether Plaintiffs could properly evaluate his test without being provided with a copy of the test plan, Mr. Murray again stated "I don't believe you could." *Id.*

As with the water flow tests, Plaintiffs were unable to determine what formulas, methodology and/or underlying data was used in conducting the heat simulations testified to and referenced by Mr. Murray. Mr. Murray testified that he input data into a software program called OpenFOAM which uses "heat transfer equations" that are coded into the program to create a simulation. (Murray Trans. 325: 3 to 326: 3; *see also* 328: 1-7). Mr. Murray was unable to specifically describe or provide what equations were used with respect to his simulations. *Id.* In fact, Mr. Murray testified that all of the data he input into the OpenFOAM simulation software, and all of the assumptions that he made, were not provided to Plaintiffs despite Mr. Murray's intention to present such simulations during the trial in this cause. (Murray Trans. 320: 17 to 321: 5). Of the limited assumptions Mr. Murray was able to testify about, it became evident that his assumptions were not based upon actual conditions during the test as Mr. Murray never inquired of those persons who were present during the test. (Murray Trans. 306: 11 to 310: 18). Accordingly, even the limited information provided to Plaintiffs regarding the heat simulations created by Mr. Murray demonstrates that the underlying data input into the OpenFOAM software is unreliable at best as it was not based upon actual conditions at the testing facility.

"The advisory committee's note to Rule 702 instructs that "[t]he trial judge in all cases of proffered expert testimony must find that it is properly grounded, well-reasoned, and not speculative before it can be admitted." *Tampa Bay Water v. HDR Eng'g, Inc.*, 2011 U.S. Dist. LEXIS 80735, *14, 2011 WL 3101803 (M.D. Fla. July 25, 2011). Notably, Mr. Murray has testified that, based upon the information disclosed to date, Plaintiffs cannot properly investigate the same:

> Q: Can I properly evaluate your test, sir, without knowing the test plan?
>
> A: I don't believe you can.

Q: Okay. Can I properly assess your test, your testing without being provided the test data?

A: I don't believe you could.

[…]

Q: Can I adequately evaluate your test data without seeing any information … regarding how it was performed, how it was run, the test data, the assumptions made, the slope, the flow rate of the water?

A: Only to the equivalent extent as I can read Italian and interpret and this.

Q: Okay. So your answer is –

A: So the answer would be no.

Q: No.

A: Yeah.

Q: Okay. So, so you, you understand that I'm sitting here today and I'm, my hands are tied. I can't really evaluate whether what you did was proper or not?

A: Uh-huh.

(Murray Trans. 338 – 39.)

For the foregoing reasons, Mr. Murray should be excluded from offering any expert opinion testimony including, but not limited to, testimony about any comparisons, tests or simulations prepared by Mr. Murray. Notwithstanding the Defendants failure to disclose all of the requisite information required by Rule 26(a)(2)(B), Mr. Murray's testimony must be excluded on the grounds that (a) it is not based upon reliable facts or evidence, (b) Murray's methodology is both unreliable and untestable, (c) such testimony is not relevant to the proceedings in this matter, and (d) Murray's conclusions would not assist the trier of fact to understand any evidence or matter at issue in this case.

IV. Mr. Rick A. Smith Fails to Satisfy the Daubert Standard

In the Expert Report of Rick A. Smith, P.E. (the "Smith Report"), dated January 30, 2017, Mr. Smith identified three "conclusions" to which he has rendered an opinion: (1) The Penon Reports, standing alone, are not valid to tabulate and compute the performance of the E-Cat; (2) the E-Cat test setup was not properly instrumented and there was no measurement of the

E-Cat's actual output; and (3) the E-Cat never produced the energy which was claimed for it.[7] As with the Mr. Murray's conclusions above, Mr. Smith's conclusions fail to satisfy the requirements for expert testimony imposed by *Daubert.*

A. Mr. Smith's Qualifications Generally

Although Mr. Smith appears to be experienced and qualified to testify with respect to certain boiler systems, Mr. Smith is admittedly not an expert regarding nuclear engineering (see Smith Trans. 27: 20-21; 37: 4-6; 128: 23-24), nuclear boilers (see *id.* 45: 18-19), and low energy nuclear reactions (see *id.* 130: 9-20). While not dispositive, it is notable that while Mr. Smith has been offered as an expert in two prior federal cases, he has never been accepted as an expert in any federal court. (see Smith Trans. 14: 13 to 15: 24). Accordingly, to the extent Mr. Smith opines to anything beyond the realm of ordinary boilers and, specifically, within the realm of nuclear engineering/reactions, Mr. Smith's opinions should be excluded.

B. Mr. Smith's Testimony Not Based Upon Reliable Methodology

For each of his opinions in this matter, Mr. Smith relies exclusively on his own personal experience as the basis for his conclusion. In fact, Mr. Smith testified at his deposition on February 27, 2017 as follows:

> Q. Now, with respect to your opinions in this case, can you state every methodology that you've relied upon in forming your opinions?
>
> A. No, because -- and the reason for that is not that I don't have them, it's just that it's a thought process that I've developed over 40 years of being an engineer, four years undergrad, graduate degree, and everything that I've done. So it's just an ongoing process that it would take weeks to try to even sort it out.
>
> I have one, but I can't give you -- unfortunately, I can't give you the specific answer that you're looking for. It's just it's in there and that's how I think and that's how I work.
>
> Q. Okay. So there's no direct methodology you can point me to that, for example, Dr. Wong, our expert, can look at and say, yes, that methodology is correct, or, no, that methodology is incorrect based on –
>
> A. Well, you know, when you say a methodology, you know, we can wrangle some words here if you'd like, but, you know, methodology seems to be more like

[7] On March 20, 2017, the day before *Daubert* motions were due and nearly two months after expert reports were required to be served, Defendants served the "Supplemental Expert Report of Rick A. Smith, P.E." which contains six (6) additional "conclusions" not previously disclosed. The substance of such additional "conclusions" are not addressed herein as Plaintiffs have been deprived of the opportunity to review such additional conclusions, confer with Plaintiffs expert and/or otherwise examine Mr. Smith regarding such matters.

in devising an experiment to figure out A, B or C. Okay. You know, here's the methodology, we're going to do this. All right.

My methodology is just a way of thinking that engineers typically use. I would imagine -- again, never met Dr. Wong either. I would imagine his thought processes along these regards and mine are probably quite similar, same for Mr. Wark, same for Mr. Murray. Okay. I should say Dr. Wark. My bad. You know what I mean.

Q. Is there -- so there's no defined, for example, formula that you have applied in formulating -- in formulating your opinions in this case? It's a culmination of your years of experience that you've relied upon in forming your opinions?

A. All of the above. I've used some formulas in talking about, you know, the heat rejected by a power plant, okay, that's a calculation. You know, the definition of COP, that's a calculation. All right. So there are formulas I used.

But, you know, your -- the answer to your question is yes. And not to be a wise guy, but it's a combination of both. (…)

Q. Can you identify any literature that would support the theory or methodology that you've applied in this case?

A. The whole body of mechanical engineering work related to thermodynamics.

Q. But there's no specific literature that you would point me to?

A. I'm going to reiterate my answer, sir. (Smith Trans: 151: 9 to 153: 22).

and;

Q. Does your methodology or theory have a known error rate?

A. How could it? It's qualitative, not -- it's quantitative in some regards, qualitative in another. (Smith Trans: 155: 15-18).

"Daubert instructs courts to consider the following factors: (1) whether the expert's theory can be and has been tested; (2) whether the theory has been subjected to peer review and publication; (3) the known or potential rate of error of the particular scientific technique; and (4) whether the technique is generally accepted in the scientific community." *United Food Mart, Inc.*, 404 F. Supp. 2d 1344. "[I]f admissibility could be established merely by ipse dixit of an admittedly qualified expert, the reliability prong would be, for all practical purposes, subsumed by the qualifications prong." *Battle v. Gold Kist, Inc.*, 2008 U.S. Dist. LEXIS 102316 (M.D. Fla.

Sept. 2, 2008) (quoting *United States v. Frazier*, 387 F.3d 1244, 1261 (11th Cir. Ga. 2004)). "An expert's unexplained assurance that his opinion rests upon accepted scientific methodology is insufficient to establish reliability." *Id.* The Smith Report begins with a lengthy, text book summation of the First and Second Laws of Thermodynamics. (Smith Report pp. 2-9.) Mr. Smith, however, does not apply such Laws to his conclusions (except to conclude via "process of elimination" that heat produced by the E-Cat must have been rejected somewhere). Accordingly, Mr. Smith's testimony and report must be excluded in their entirety.

C. Mr. Smith's First "Conclusion": The Penon Report

In addition to the above, Mr. Smith's first "conclusion" fails to satisfy the remaining *Daubert* requirements. Addressing the first prong of the three-party inquiry mandated in *Daubert,* it is evident that Mr. Smith is not qualified to opine as to the propriety or validation of the Penon Report. Namely, Mr. Smith is unfamiliar with, and has not experience with, nuclear engineering (see Smith Trans. 27: 20-21; 37: 4-6; 128: 23-24), low energy nuclear reactions (see *id.* 130: 9-20), test plans for low energy nuclear reactions (*See id.* 157: 1-5*),* and/or the nature of the reaction underlying the E-Cat (see *id.* 130: 17-19). Notwithstanding his lack of expertise or knowledge in those fields, Mr. Smith purports to offer his opinion with respect to the contents of Mr. Penon's report regarding the performance of the E-cat. *See* Smith Report at 10. A review of the Smith Report with regard to his first conclusion shows that it is nothing more than a summary and explanation of the contents of the Penon report without providing any basis for his ultimate conclusion as discussed above. *Id.*

Importantly, Mr. Smith's first conclusion fails to satisfy the third prong required by *Daubert* that the testimony "assists the trier of fact, through the application of scientific, technical, or specialized expertise to understand the evidence or determine a fact in issue. *Hendrix ex rel. G.P. v. Everflo Co.,* 609 F.3d 1183, 1194 (11^{th} Cir. 2010). Specifically, Mr. Smith's conclusions regarding the Penon report are not relevant to any matter at issue in this case. As discussed above, the License Agreement did not provide for any challenge or reconsideration of the ERV's findings.

D. Mr. Smith's Second Conclusion: The E-Cat Test Was Insufficient

The Plaintiffs re-assert the argument above regarding Mr. Smith's qualifications to opine regarding matters pertaining to the E-cat the testing thereof and incorporate the same herein with respect to Mr. Murray's second conclusion. Mr. Smith's second conclusion states that the "test setup was not properly instrumented and there was no measurement of the E-Cat's actual output." *Smith Report* at 21. Specifically, Mr. Smith testified that in his opinion, "it is not possible to accurately measure the output of the E-Cat" using Penon's test plan. *Id.* at 13. As with his first opinion, Mr. Smith's conclusion is not based upon reliable methodology, theories or techniques as discussed above.

Moreover, even if Mr. Smith were qualified and had based his opinions on sound and reliable methodologies, such testimony would not assist the trier of fact in understanding or deciding an issue in this case. Specifically, the test plan and procedures employed by the ERV were agreed upon by the parties prior to the initiation of the test. Accordingly, Mr. Smith's conclusions regarding the propriety of the test plan employed by the ERV is not relevant to the instant action. "Whether testimony assists the trier of fact 'goes primarily to relevance. Expert testimony which does not relate to any issue in the case is not relevant and, ergo, non-helpful." *Geter v. Galardi South Enters.*, 2015 U.S. Dist. LEXIS 59927, 2015 WL 2155721 (S.D. Fla. May 7, 2015). Notably, Mr. Smith was advised by the Defendants that the test plan had been agreed to as evidenced by his testimony as follows:

> Q: Okay. And did anyone ever tell you in this case that the defendants, Ms. – I'm sorry, Industrial Heat and IPH International B.V. agreed to that test plan?
>
> A: They have, yes.
>
> Q: They did tell you that?
>
> A: They did, yes.
>
> Q: Okay. So you were aware that that was an agreed-to test plan?
>
> A: I am aware of that.

(Smith Trans. 108: 13-22). Clearly, the time to question the veracity of the ERV's test plan has long since come and gone. Defendants have not asserted any legal basis to now challenge the propriety of the test plan where they failed to do so at any time during the year long test, nor have they raise such issue in their pleadings. Accordingly, Mr. Smith's testimony relating to the propriety and/or instrumentation of the test plan must be excluded.

E. <u>Mr. Smith's Third Conclusion: E-Cat Never Produced Energy Claimed</u>

Finally, Mr. Smith concludes that the E-Cat never produced the energy which was claimed for it because the "energy had to be rejected somewhere, and analysis has shown, by the process of elimination, that the claimed energy never existed." (Smith Report p. 21.) As with his other opinions, this conclusion is again just another attempt to second guess the report of the ERV. As such, Mr. Smith's testimony is irrelevant to the matters in this case. In essence, Mr. Smith concludes that he did not see any means of ventilating the heat being produced by the E-Cat and, as such, the E-Cat was not producing heat. Mr. Smith arrives at this conclusion based upon photographs, information provided to him Defendants and Mr. Murray, and based upon the "process of elimination." Mr. Smith otherwise offers no methodology and/or theory upon which he arrives at this conclusion, and fails to account for additional possibilities such as the inclusion of a heat exchanger. In other words, Mr. Smith makes an analytical leap based upon his unfounded beliefs and assumptions as to the facts in this case. Such a leap would only confuse or mislead the jury.

Moreover, Mr. Smith's last opinion is based upon his "process of elimination" relating to potential means by which heat could be dispersed from the Doral facility. Amazingly, while applying his "process of elimination," Mr. Smith refused to consider alternative means of heat dispersion such as a heat exchanger based solely upon his believe that a heat exchanger was not used. (Smith Trans. 182: 17 to 185:2). Mr. Smith's failure to even consider the possibility of the existence of a heat exchanger renders his conclusion unreliable. "Proffered expert testimony generally will not help the trier of fact when it offers nothing more than what lawyers for the parties can argue in closing arguments." *Meyerson v. Walgreen Co.*, 2006 U.S. Dist. LEXIS 97267, *12, 2006 WL 5249740 (S.D. Fla. May 18, 2006). Where, as here, the expert merely applies the process of elimination to arrive at a conclusion, if such deductive reasoning could adequately be performed by a layperson, such testimony should be excluded under *Daubert. See Id.* In the instant case, a lay juror could easily deduct the existence or non-existence of a method of dissipating heat (if it were relevant to this case) by looking at photos as Mr. Smith did.

Lastly, Experts may not simply repeat or adopt the findings of other experts without investigation them. *Hendrix v. Evenflo Co.*, 255 F.R.D. 568 (N.D. Fla. 2009) (*citing In re Polypropylene Carpet Antitrust Litig.*, 93 F. Supp. 2d 1348 (N.D. Ga. 2000) (finding blind reliance by expert on other expert opinions demonstrates flawed methodology under *Daubert*); *Tk-7 Corp. v. Estate of Barbouti*, 993 F.2d 722-33 (10th Cir. 1993) (excluding expert opinion relying on another expert's report because witness failed to demonstrate a basis for concluding report was reliable and showed no familiarity with methods and reasons underlying the hearsay report.)).

Mr. Smith opines that based upon the amount of heat claimed to be generated by the E-cat, such heat could not have dissipated into the surrounding area. To support this conclusion, Mr. Smith relied upon Mr. Murray's heat simulations and conclusions. *Smith Report* at 16. In fact, Mr. Smith testified that he was unaware of any presumptions were made by Mr. Murray in creating the relied upon simulations and that Mr. Smith did not do any simulations of his own. (Smith Trans. 296: 20 to 297: 12). It is difficult, if not impossible given Mr. Smith's lack of reliable methodology, to determine whether Mr. Smith's opinions are actually opinions, or merely regurgitations of statements and conclusions made by Mr. Murray and Mr. James Stokes. For example, Mr. Smith "opines" that "Mr. Joe Murray addressed some of his concerns to the ERV concerning the flow meter. This author shares Mr. Murray's concerns and would like to see the ERV's responses. This author also shares the other concerns Mr. Murray has about the other issues in his letter…." (Smith Report p. 14.)

Furthermore, Mr. Smith also relies heavily upon the purported "investigations" performed by Mr. Murray including: (1) "video and photo of the flow meter time lapse conducted by Joseph Murray"; (2) "[v]ideos of the heat simulation conducted by Joe Murray"; (3) "[p]hotos taken by Joseph Murray at the Doral Location"; (4)"Joseph Murray's October 31, 2016 Power Analysis"; and (5) "[t]elephone interviews with Joseph Murray." (Smith Report Ex. B.). In essence, Mr. Smith seeks to improperly invade the province of the jury. Accordingly, such testimony must be excluded.

V. Additional opinions

As discussed in part above, Mr. Smith also testified in deposition that he may testify as to additional opinions not set forth in his Expert Report. (Smith Trans. 112). The Plaintiffs request the Court summarily exclude testimony regarding any previously undisclosed opinions as admitting such testimony would severely prejudice the Plaintiffs who have been deprived of the opportunity to prepare and meet such testimony, including the retention of additional experts, if necessary.

Dated: March 22, 2017.

Respectfully submitted,

/s/John W. Annesser, Esq.

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CERTIFICATION OF COMPLIANCE WITH LOCAL RULE 7.1(a)(3)

The undersigned counsel hereby certifies that, in compliance with Rule 7.1(a)(3), Federal Rules of Civil Procedure, that undersigned counsel has conferred with counsel for Defendants in a good faith effort to resolve by agreement the issues raised in this Motion.

/s/John W. Annesser, Esq.
John W. Annesser, Esquire

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was served by in the manner specified below on March 22, 2017 all counsel or parties of record on the attached Service List.

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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

ANDREA ROSSI and LEONARDO CORPORATION,

Plaintiffs,

v.

THOMAS DARDEN; JOHN T. VAUGHN, INDUSTRIAL HEAT, LLC; IPH INTERNATIONAL B.V.; and CHEROKEE INVESTMENT PARTNERS, LLC,

Defendants.

CASE NO. 1:16-cv-21199-CMA

EXPERT DISCLOSURE OF JOSEPH A. MURRAY

INDUSTRIAL HEAT, LLC and IPH INTERNATIONAL B.V.,

Counter-Plaintiffs,

v.

ANDREA ROSSI and LEONARDO CORPORATION,

Counter-Defendants,

and

J.M. PRODUCTS, INC.; HENRY JOHNSON; FABIO PENON; UNITED STATES QUANTUM LEAP, LLC; FULVIO FABIANI; and JAMES BASS,

Third-Party Defendants.

EXHIBIT "A"

EXPERT DISCLOSURE OF JOSEPH A. MURRAY

Defendants THOMAS DARDEN, JOHN T. VAUGHN, INDUSTRIAL HEAT, LLC ("IH"), IPH INTERNATIONAL B.V. ("IPH"), and CHEROKEE INVESTMENT PARTNERS, LLC (collectively, "Defendants"), pursuant to Fed. R. Civ. P. 26 (a)(2)(C), hereby submit the expert disclosure of Joseph A. Murray:

I. INTRODUCTION

Joseph A. Murray, former Vice President of Engineering for Industrial Heat, LLC, shall be testifying as to his opinions concerning the accuracy and reliability of the report by Fabio Penon of the E-Cat plant as well as the performance of the E-cat plant itself.

II. SUMMARY OF OPINIONS

Comparisons Between Power Sold By Florida Power & Light Company to J.M. Products, Inc. and Power Reported As Absorbed By Fabio Penon and Fulvio Fabiani

Mr. Murray will describe how the data generated by Fabio Penon ("Penon") and Fulvio Fabiani ("Fabiani") pertaining to the power absorbed during the testing of the E-cat plant at ADDRESS OF DORAL LOCATION("JMP") is at odds with the the amount of power used at Doral location as demonstrated by Florida Power & Light Company ("FPL") records. *See* ***"Exhibit A."*** Using the values of power absorption into the reactor reported by Penon to Industrial Heat, LLC, Mr. Murray compared these numbers to the actual power provided by FPL to the Doral location and found numerous inaccuracies reported by Penon and Fabiani.

Mr. Murray also compared Penon and Fabiani's data to the historical average amount of power that the Doral location used before and after the purported "guarantee performance test" (specifically before and after the reactor was turned on). Once again, Mr. Murray's analysis demonstrates that Penon and Fabiani's reports on the power absorbed into the E-cat plant are inaccurate when measured against power provided by FPL to Doral location are riddled with inaccuracies when measured against the power actually provided by FPL to the plant. *See* **"Exhibit B."**

Inverse Relationship of Power Input to Plant and Coefficient of Power

Using the values reported by Penon to Industrial Heat, Mr. Murray compared the reported power input to the E-cat plant reported by Penon against the reported coefficient of power ("COP") reported by Penon as reflected in Figure *See* **"Exhibit C."** After comparing the two sets of numbers, Mr. Murray's results revealed an inverse relationship between the input power and the COP (i.e., when the plant draws less power, the COP of the E-cat plant increases). Mr. Murray will testify that there is no logical reason why the COP should be changing inversely to the amount of power inputted given that the same E-cat plant was used throughout the "guaranteed performance test."

Heat Simulations

Mr. Murray will testify as to the heat simulations he ran to recreate the thermal conditions inside the Doral location The thermal simulation involved a 500 kw or 800 kw power source uniformly distributed in a container at the Doral location, 7861 NW 46th Street, Doral, FL 33166 and releasing heat into the ambient warehouse of the Doral location. Mr. Murray's simulation demonstrates how the heat would typically build over time to achieve a steady state temperature. *See "Thermal Simulations"* This means that the room would have been heated to a temperature unsuited for a human working environment.

Water Flow

Mr. Murray will be testifying as to the tests he conducted on the water flow into the E-cat plant. The results of Mr. Murray's test show that the measured flow meter used by Penon would report a much higher flow of water than was actually occurring. The purpose of the test was to determine how the flow meter used by Penon operated when a limited amount of water flowed through it. Murray's results showed that the water meter Penon used would show the results that Penon reported when in fact the actual water flowing through the meter was multiples less than what the meter showed. the behavior of the flow meter when a very minimum amount of water was going through it. *See "Water Flow Test Results"*.

QUALIFICATIONS

Mr. Murray's educational background includes an ABD from University of Maryland, an M.S. from University of Utah and a B.S. from Michigan State University.

Dated: January 30, 2017.

Respectfully submitted,

/s/ Christopher R.J. Pace

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing was served by e-mail on counsel of record this 30th day of January, 2017.

/s/ Michael A. Maugans
Michael A. Maugans

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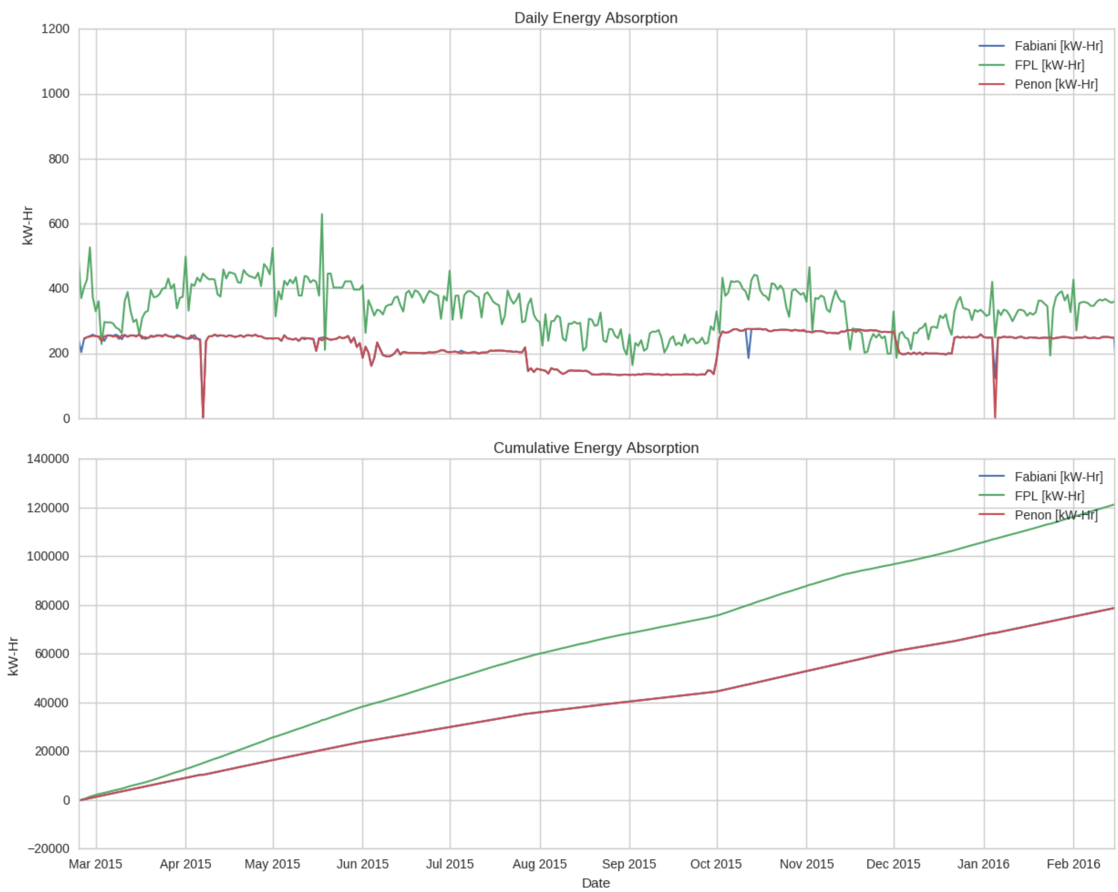
EXHIBIT A


Daily Energy Absorption
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FPL [kW-Hr]
Penon [kW-Hr]
kW-Hr
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1000
800
600
400
200
0
Cumulative Energy Absorption
Fabiani [kW-Hr]
FPL [kW-Hr]
Penon [kW-Hr]
kW-Hr
140000
120000
100000
80000
60000
40000
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Nov 2015
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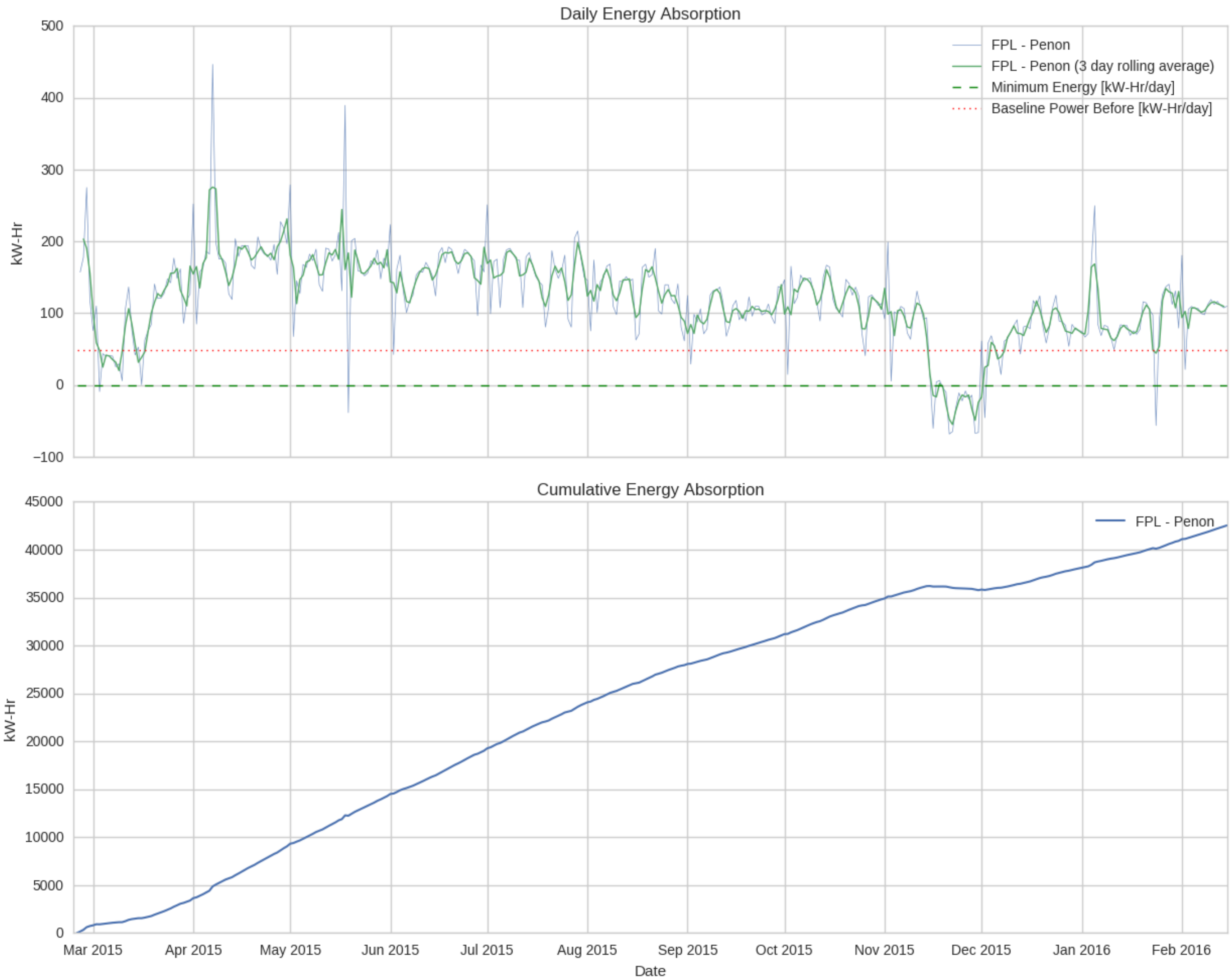
Jan 2016
Feb 2016
Date

EXHIBIT B



Daily Energy Absorption
FPL - Penon
FPL - Penon (3 day rolling average)
Minimum Energy [kW-Hr/day]
Baseline Power Before [kW-Hr/day]
kW-Hr
500
400
300
200
100
0
−100
Cumulative Energy Absorption
FPL - Penon
kW-Hr
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
Mar 2015
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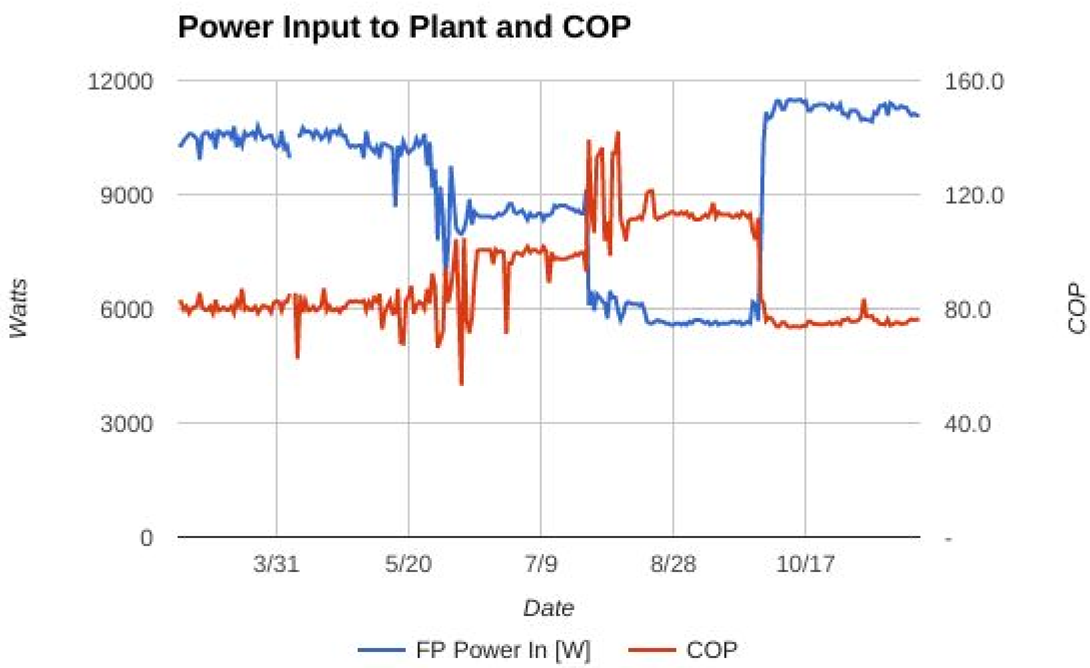
Jan 2016
Feb 2016
Date

EXHIBIT C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9000
6000
3000
0
Watts
160.0
120.0
80.0
40.0
-
COP
3/31
5/20
7/9
8/28
10/17
Date
FP Power In [W]
COP

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

ANDREA ROSSI and LEONARDO CORPORATION,

Plaintiffs,

v.

THOMAS DARDEN; JOHN T. VAUGHN, INDUSTRIAL HEAT, LLC; IPH INTERNATIONAL B.V.; and CHEROKEE INVESTMENT PARTNERS, LLC,

Defendants.

CASE NO. 1:16-cv-21199-CMA

EXPERT REPORT OF RICK A. SMITH, P.E.

INDUSTRIAL HEAT, LLC and IPH INTERNATIONAL B.V.,

Counter-Plaintiffs,

v.

ANDREA ROSSI and LEONARDO CORPORATION,

Counter-Defendants,

and

J.M. PRODUCTS, INC.; HENRY JOHNSON; FABIO PENON; UNITED STATES QUANTUM LEAP, LLC; FULVIO FABIANI; and JAMES BASS,

Third-Party Defendants.

EXHIBIT "B"

EXPERT REPORT OF RICK A. SMITH, P.E.

Defendants THOMAS DARDEN, JOHN T. VAUGHN, INDUSTRIAL HEAT, LLC ("IH"), IPH INTERNATIONAL B.V. ("IPH"), and CHEROKEE INVESTMENT PARTNERS, LLC (collectively, "Defendants"), pursuant to Fed. R. Civ. P. 26 (a)(2)(B), hereby submit the expert report of Rick A. Smith, P.E.:

I. INTRODUCTION

I, Rick A. Smith, P.E. principal of Applied Thermal Engineering, Inc., located at 7400 Brown Road, Ostrander, OH 43061, have been retained by counsel for Defendants in the above-captioned litigation to provide my opinions concerning the reported validation of certain low energy nuclear reactor ("LENR") technology referred to as the "E-Cat." Specifically, I have been asked to render my opinions on the following issues:

1. Whether the device tested by Mr. Penon in Doral, Florida, from February 2015 through February 2016 operated at a coefficient of performance of at least 10.85 for a period of 350 days (even if not consecutive) within any 400 day period prior to March 29, 2016.
2. Whether the device so tested in Doral consistently produced energy more than 2.6 times greater than the energy consumed by the device and whether the temperature of the steam produced by the device was consistently 100 degrees Celsius or greater.

II. STATEMENT OF OPINIONS

Equipment Description

This author has not yet been able to inspect the E-Cat site in Florida. The address of this site is 7861 NW 46th Street, Doral, FL 33166-5470. However, based upon information currently available to him, the author believes that the equipment in question at the Florida site is: the E-Cat, a device invented by plaintiff, Andrea Rossi, a purported chemical processing/production facility run by J. M. Chemical Products, Inc. or J.M. Products, Inc. (hereinafter JM), and related piping, electrical equipment, utilities, etc. to support the two ventures. The author believes that the purpose of the E-Cat was to sell steam, via Mr. Rossi's company Leonardo Corp., to JM.

Background, Observations, and Narrative

One claim, perhaps the primary claim, of Mr. Rossi's invention, the E-Cat, is that it will produce many times more energy than it consumes. The author's understanding is that defendants Industrial Heat and IPH International, B.V. entered into a contractual arrangement with Mr. Rossi, based upon a hope that the E-Cat might, in fact, produce more energy than it consumed.

The author's understanding is that the plaintiffs contend that the Report dated 03/28/2016 by Dr. Ing. Fabio Penon is validation of the E-Cat's performance. The purpose of the author's investigation is to determine if the E-Cat did, in fact, produce more energy than it consumed, as Mr. Penon reported. The author has not been asked to form an opinion, nor has he formed an opinion on the physics of the reaction claimed by Dr. Rossi.

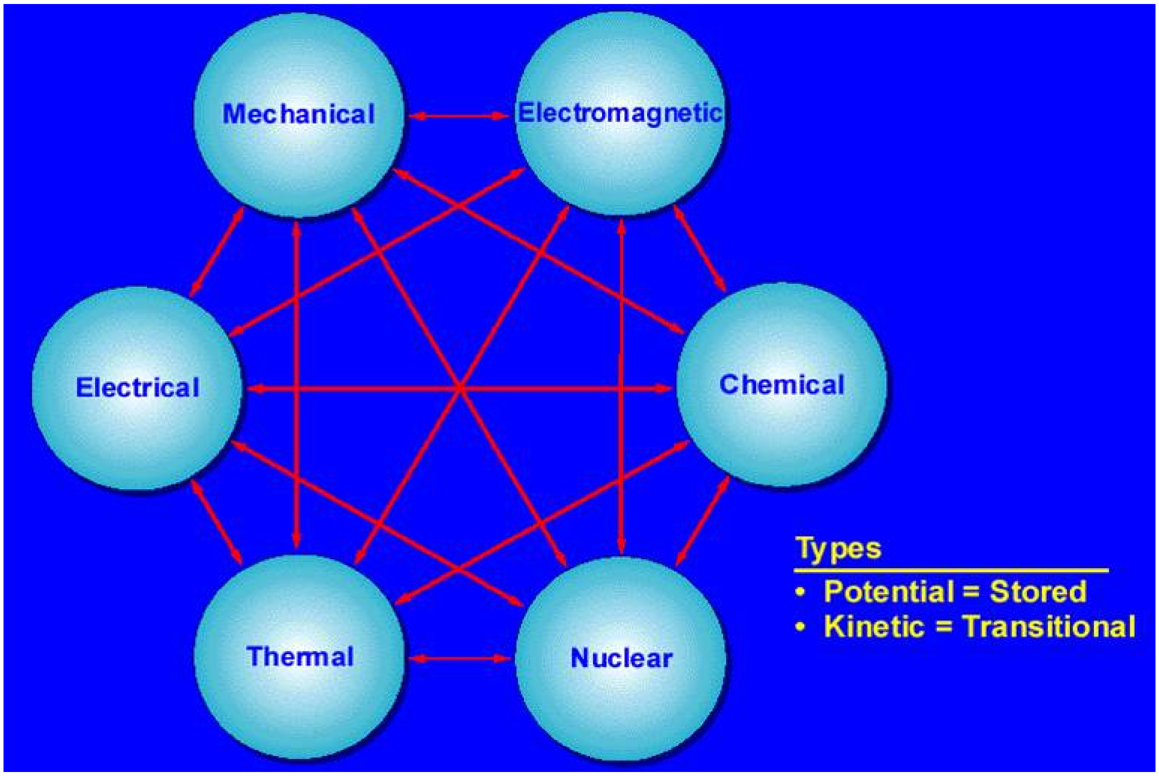
Basic Thermodynamics

The author will discuss the basics of thermodynamics before he analyzes the claimed performance of the E-Cat.

There are two foundational laws of thermodynamics, the First, and the Second.

The engineering definition of the first law of thermodynamics, in Thermodynamics, by Kenneth Wark, states: "When a closed system is altered adiabatically [i.e. without heat transfer], the work is the same for all possible paths which connect the two given equilibrium states." To put this into normal English, the first law of thermodynamics states that neither matter, nor energy, can be created or destroyed, they can only change form.

There are many forms of energy. A few of them are chemical, electrical, mechanical, nuclear, thermal, electromagnetic, and so on. Please see the picture below.

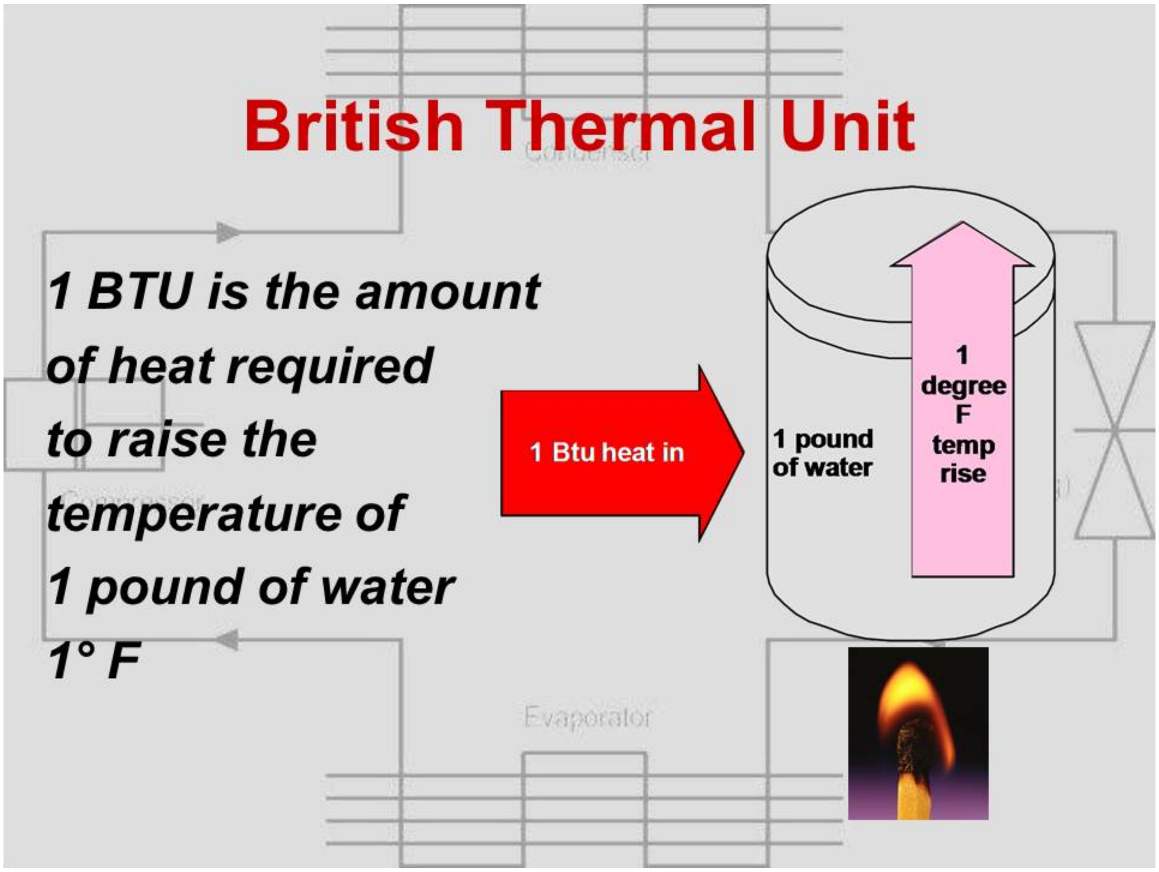


In theory, they are all interchangeable. A ubiquitous example is a cell phone battery. When the phone is in use, the battery is using chemical energy to generate electrical energy. When the phone is charging, electrical energy is being converted into chemical energy. These two conversions are very interchangeable.

In other instances, the interchangeability is somewhat limited. Nuclear energy is generally a one-way street. In a nuclear weapon, for example, the nuclear energy released by the explosion produces enormous amounts of thermal, mechanical, and electromagnetic energy. In a nuclear power plant, the controlled decay of the isotopes produces enormous amounts of thermal energy to produce electrical power or propel a ship.

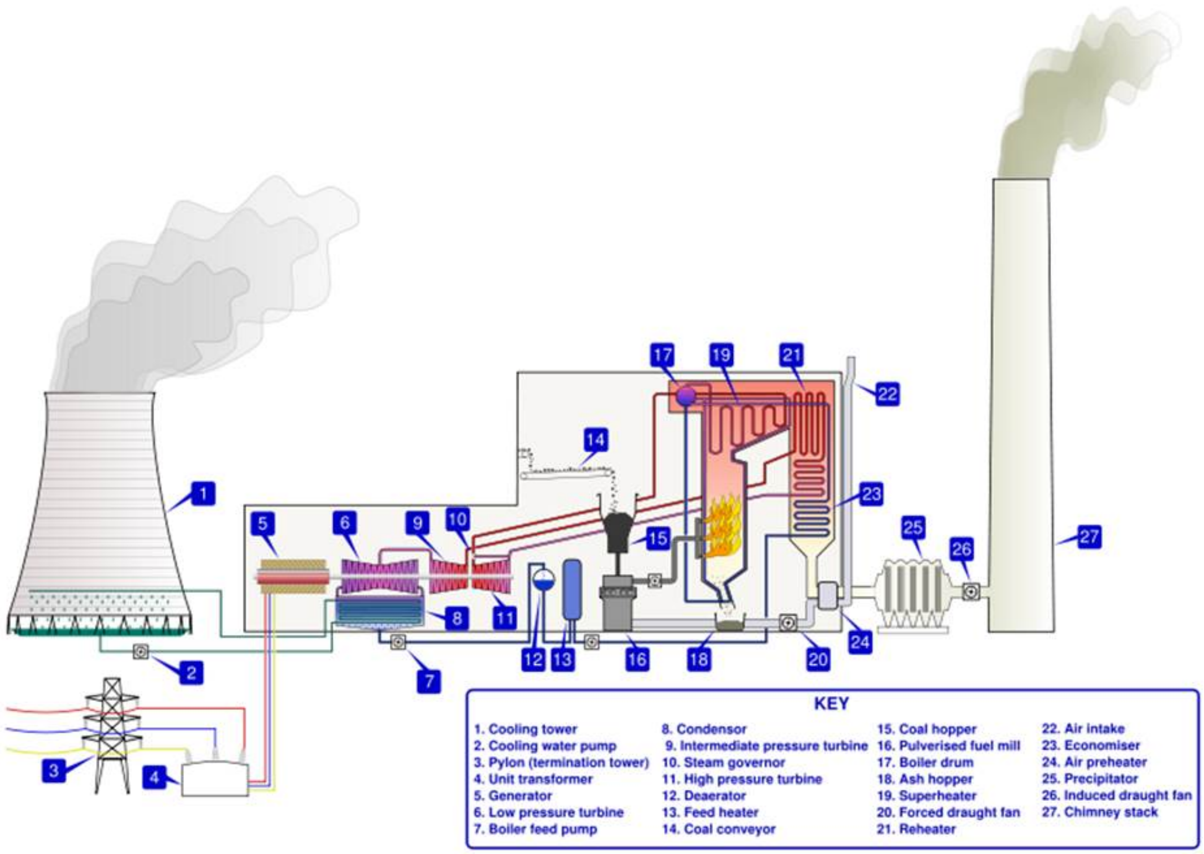
Dr. Wark defines the second law of thermodynamics thusly: "The entropy of an isolated system always either increases or remains the same when the system changes from one equilibrium state to another." In other words, energy systems always "roll downhill" when left to themselves. Thermal systems will always proceed from hot (higher energy) to cold (lower energy), left to themselves; they will never go from cold to hot unaided. The human body does not generally become stronger, healthier, or more agile as one ages. The author has personal experience with this.

Another fundamental definition is that of a BTU, or British Thermal Unit. A BTU is the amount of heat required to raise (or lower) one pound of water one degree Fahrenheit.



A wooden kitchen match contains about one BTU, to put things into perspective.

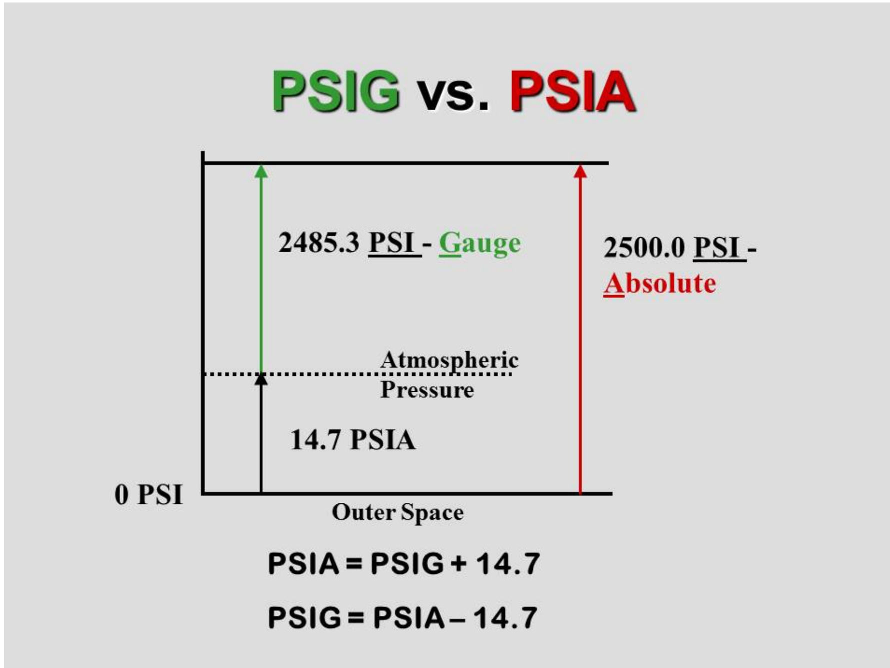
Let's do a quick entropy example in a hypothetical, but realistic situation. The picture below shows a conventional, coal fired steam power plant.



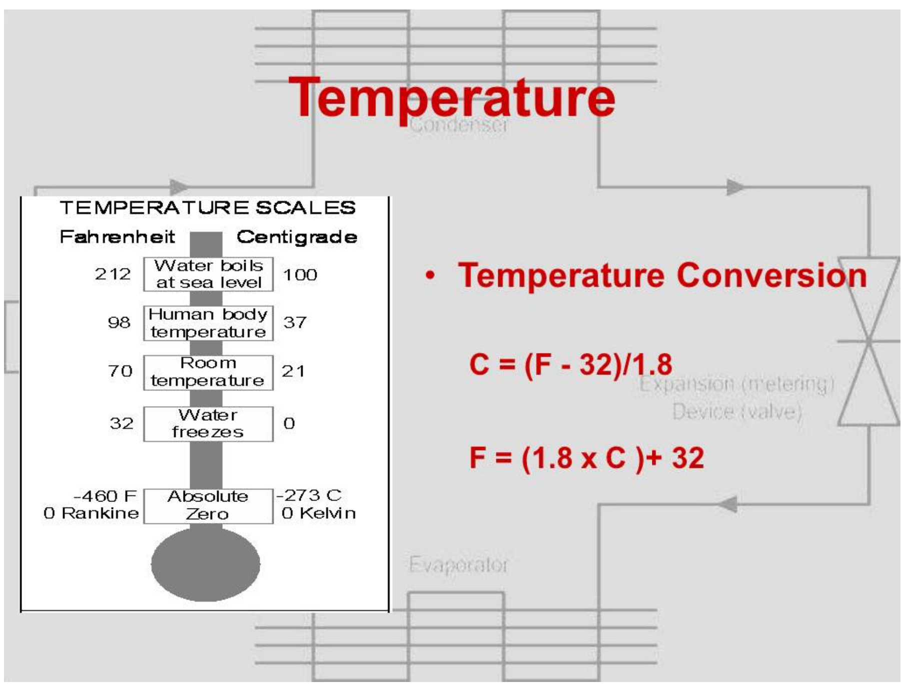
A conventional steam power plant might have steam leaving the boiler at a pressure of 2485.3 PSIG (Pounds per Square Inch, Gauge). This is equivalent to 2500 PSIA (Pounds per Square Inch, Absolute).

Gauge pressure has the local atmospheric pressure as its base, normally 14.696 PSIA, at sea level. Think Miami. Absolute pressure has zero as its base. Absolute pressure equals gauge pressure plus the local atmospheric pressure, and is used in most thermodynamic calculations. So in this example: 2485.3 + 14.7 = 2500.0

Please see the following picture for pressure and temperature comparisons.



The leaving steam temperature of our hypothetical power plant might be 990° F. This is equivalent to 1450° R (degrees Rankine), or absolute temperature. Our Fahrenheit temperature scale is based upon water freezing at 32° F and boiling at 212°F (at sea level pressure). In our English measuring system, absolute zero is 0° Rankine. To obtain degrees Rankine from Fahrenheit, one must add 460. So, water freezes at 492° R.



Now, in our hypothetical steam plant with superheated steam leaving the boiler at 2500 PSIA, and 1450° R, the steam would have an entropy of 1.6966 BTU per pound per degree Rankine. The enthalpy (heat content) of the steam is 1741.7 BTU per pound of steam.

The condenser of our power plant will operate in a deep vacuum, in order to maximize the work output and the thermal efficiency of the plant. If the condenser operates at 0.6 PSIA, its condensing temperature will be 85° F (545° R), and the steam entering the condenser will have an entropy of 2.0218 BTU per pound per degree Rankine. As the power plant converts the thermal energy of the fuel into thermal energy in the steam, into mechanical energy in the turbines, and then into electrical energy in the generator, the entropy of the system increases from 1.6966 to 2.0218. This plant obeys the second law of thermodynamics, as do all legitimate power producing systems.

Remember that there are many losses in the system: the boiler shell as well as the steam lines give off heat to the environment, there are fluid friction losses in the steam and water piping systems and air and gas handling systems, there are combustion losses due to the inefficiencies in combustion and the exit gas temperature, there are mechanical and windage losses in the turbine and generator, there are electrical losses in the generator, wiring, and transformer. All of these losses are irrecoverable and unavoidable. Further, it takes a huge amount of internal power (pumps, fans, conveyors, etc.) to run a power plant, as well as the cost of running the pollution control systems. Utilities spend enormous resources to reduce these losses and maximize the efficiencies of their plants, as well as minimizing the plant pollution.

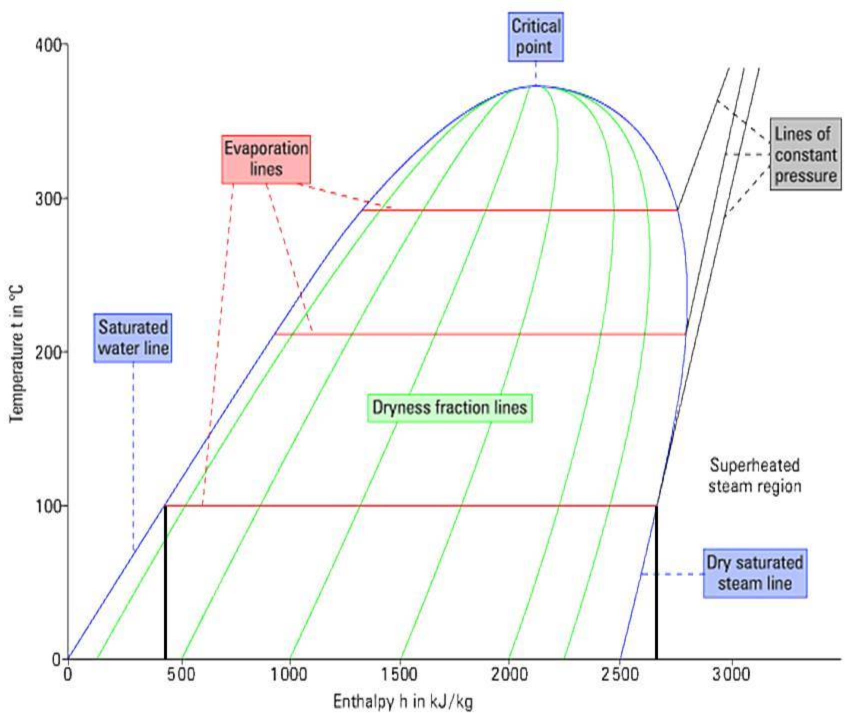
The steam entering the condenser has a total enthalpy of 1098.6 BTU per pound, and an evaporation heat content of 1045.5 BTU per pound. For each pound of steam that passes through the system, 696.2 BTU's (1747.1 – 1098.6) are available to do work and thereby generate electricity.

The astute reader has observed that the steam still has a lot of energy left as it enters the condenser, 1045.5 BTU per pound to be exact. Why can't more power be extracted from that steam? Because it is at almost no pressure, only 0.6 PSI above a perfect vacuum or zero pressure. There is no pressure left to spin a turbine and do more work. This heat MUST be rejected to the atmosphere. That is the purpose of the condenser and the cooling tower.

The condenser is a heat exchanger which uses water from the cooling tower to remove the heat from the low pressure steam and convert it back to water (condensate), so it (the condensate) can be recycled through the plant over and over. The cooling tower water loop pumps the water outside the plant to a cooling tower, where the water is cooled by ambient air passing over it. This is where the waste heat from the plant is rejected. The cooler water from the cooling tower then returns to the condenser to remove more heat from the low pressure steam in the condenser.

A crucial point that the reader must fully understand is that the rejected heat MUST GO SOMEWHERE. It does not just simply vanish, rejected heat generated by indoor equipment must be rejected to the atmosphere by mechanical equipment. This is true of any and every thermal plant. The "air conditioner" which normally sits outside one's house, is in reality only the compressor and condenser section – the other parts, which are connected by a line set between the two, are inside the house. The box outside the house is that part of the system which rejects the heat collected from inside the house to the ambient atmosphere.

Another thermodynamic concept that must be understood is that the boiling point of water (or any liquid) depends upon the pressure of the liquid. At sea level conditions, water boils at 212° F. At Leadville, CO, which is at an elevation of just over 10,000 feet (the local atmospheric pressure is about 10 PSIA, not 14.7 PSIA), water boils at about 192° F. In a typical industrial boiler which operates at 150 PSIG (164.7 PSIA) the water boils at 366° F. When a liquid is at its boiling point, it can exist as 100 % liquid, or 100 % vapor, or any fraction in between depending upon how much heat has been put into it at a given time. The picture below shows this.



The units in the picture are metric, but the concept remains. Also, saturation is a term of art used in the thermodynamic world. It means that a fluid is saturated with heat. In a closed pressure vessel, where liquid and vapor are in physical contact with each other, the fluid in the vessel (water in a boiler or refrigerant in an air conditioning system) can exist as 100 % water (the left portion of the blue line), 100% vapor (the right portion of the blue line), or any fraction in between (the green internal lines) depending upon how much heat has been put into the fluid at a particular time.

Another crucial issue regarding the red evaporation lines is that each point on the line represents the value of the energy (enthalpy) in the fluid at that point. The bottom red line is at 100° C which also happens to be the nominal fluid output temperature of the E-Cat. Furthermore, the saturation pressure for 100° C water is atmospheric pressure or 1 bar absolute.

A pressure level of one bar is equal to one atmosphere at standard sea level conditions (14.696 PSIA English).

At the left, where the red line and the blue (saturated water) line intersect, the enthalpy is about 418 kJ/kg (kilo Joules per kilogram of water). On the right side, where red and blue intersect, the enthalpy is about 2676 kJ/kg (I looked them up. I cannot actually interpolate that well). The difference is 2258 kJ/kg. This difference is the amount of heat it takes to convert a kg of water at 100° C to a kg of steam at 100° C, both at one bar pressure.

In English units, the enthalpy of saturated water is 180 BTU per pound at 212° F and atmospheric pressure, 14.696 PSIA. The enthalpy of saturated steam at the same conditions is 1150 BTU per pound. Therefore, it takes 970 BTU's per pound of fluid to convert water into steam.

It should be immediately obvious to the reader that it takes a great deal of energy to convert a kilogram or a pound of water into the equivalent amount of steam. In fact, it takes over five times the energy to convert a pound of water to a pound of steam than it does to raise the temperature of water from the freezing to the boiling points.

Also, for any given fluid, the boiling temperature is dependent on the pressure the fluid is experiencing. Again, where liquid and vapor are in physical contact with each other, the temperature - pressure relationship for a given fluid is fixed and immutable. At a given pressure, the temperature of the fluid WILL be fixed by that relationship. And at that fixed temperature and pressure, there can be 100 % liquid, 100 % vapor, or any fraction in between. The horizontal red evaporation lines illustrate this concept.

Superheated steam (or any superheated vapor) is at a temperature above the saturation temperature for a given pressure. Obviously, the fluid is 100 % vapor, and there is no liquid present. Superheated steam is generated in a separate set of tubes which remove the steam from the liquid and then heat the steam to a temperature higher than the saturation temperature.

The author now begs the reader's forgiveness for subjecting the reader to the previous six pages of thermodynamics. However, a basic understanding of this subject is crucial if the reader is to understand the concepts which will be discussed below as they relate to the subject litigation.

E-CAT MW1 Energy Plant Final Report

This report, dated 03/28/2016 by Dr. Ing. Fabio Penon is claimed to be the validation report of the E-Cat's performance. Penon is referred to as the Expert Responsible for Validation (ERV) in various documents, and will be referred to as such in this document, although the author expresses no opinion on whether Engineer Penon was the ERV as specified in the parties' contractual documents.

This author's search of the internet reveals a prior relationship between Dr. Penon and Mr. Rossi. If true, this author wonders how Dr. Penon could have been an objective, dispassionate third party verifier.

Defendants' Third Amended Answer, Additional Defenses, Counterclaims and Third-Party Claims identifies many issues regarding the test protocol, adherence to the original test plan, number of cells in service, and related issues. Due to time constraints, this author will not address these issues in this report, but reserves the right to address them in the future.

In general, this author is not in this report discussing the E-Cat, per se. First, he has not had a chance to inspect it, although he has viewed many photos of it. Secondly, he has seen no documentation of the machine itself. Again, the author reserves the right to address this in the future.

Mr. Penon's Data

The author has inspected Engineer Penon's reports, and also summaries of Penon's data in Excel spreadsheets titled, ROSSI_00001075 and ROSSI_00008579.

Final Report Annexe 13: Daily valuation of the energy multiple - FEBRUARY 2016

		days of functioning	average power supply (wh/h)	supplied energy (wh/d)	tank water T max (°C)	effective flowed water(Kg/d)	reduced flowed water (kg/d)	steam T min (°C)	steam pressure (bar)	produced energy (wh/d)	COP
01/31 22.30	02/01 22:30	339	10291,7	247000	68,1	36000	32400	104,6	0.0	2,03E+07	82,3
02/01 22.30	02/02 22:30	340	10375,0	249000	68,5	36000	32400	104,7	0.0	2,03E+07	81,7
02/02 22.30	02/03 22:30	341	10375,0	249000	69,2	36000	32400	104,7	0.0	2,03E+07	81,7
02/03 22.30	02/04 22:30	342	10375,0	249000	69,6	36000	32400	104,7	0.0	2,03E+07	81,7
02/04 22.30	02/05 22:30	343	10500,0	252000	70	36000	32400	104,7	0.0	2,03E+07	80,7
02/05 22.30	02/06 22:30	344	10333,3	248000	68,5	36000	32400	104,6	0.0	2,03E+07	82,0
02/06 22.30	02/07 22:30	345	10291,7	247000	70,3	36000	32400	104,7	0.0	2,03E+07	82,3
02/07 22.30	02/08 22:30	346	10375,0	249000	68,5	36000	32400	104,7	0.0	2,03E+07	81,7
02/08 22.30	02/09 22:30	347	10291,7	247000	68,5	36000	32400	104,7	0.0	2,03E+07	82,3
02/09 22.30	02/10 22:30	348	10291,7	247000	68,5	36000	32400	104,7	0.0	2,03E+07	82,3
02/10 22.30	02/11 22:30	349	10458,3	251000	68,9	36000	32400	104,6	0.0	2,03E+07	81,0
02/11 22.30	02/12 22:30	350	10458,3	251000	68,5	36000	32400	104,6	0.0	2,03E+07	81,0
02/12 22.30	02/13 22:30	351	10458,3	251000	68,9	36000	32400	103,6	0.0	2,03E+07	81,0
02/13 22.30	02/14 22:30	352	10375,0	249000	68,5	36000	32400	103,6	0.0	2,03E+07	81,7
02/14 22.30	02/15 22:30	-	10375,0	249000	68,9	36000	32400	103,9	0.0	2,03E+07	81,7

The picture just above is one of the pdf annexes of Penon's report.

The Penon reports generally (with some variation) contain certain data. The author understands that these data were provided to Industrial Heat as pdf files and not as Excel spreadsheets. The columns are not labeled as in an Excel spreadsheet, so each column will be referred to by its title. The verbatim column descriptors shown below the title block will be reproduced for clarity.

The first four columns are the date and time columns. These are unremarkable.

The entitled "days of functioning", is the cumulative days counter. This is also unremarkable.

The column entitled "average power supply (wh/h)". This would appear to be the average power supplied to the E-Cat. (wh/h) is watt hours per hour, which equals watts. Some months are in wh/h and others are in Kwh/h. This difference in units is of no concern. An interesting thing occurs starting in June, 2015. If one takes the number in the column entitled "supplied energy wh/d" and divides it by 24, one gets the exact number in the "average power supply (wh/h)" column to five digit precision.

The column entitled "supplied energy wh/d". This is apparently the daily energy supplied to the E-Cat. If one takes the values in "average power supply" column and multiplies by 24, one obtains the almost exact value in the "supplied energy wh/d". Here is the problem. Instead of a value of 247,000 this column on Feb. 06, the author would expect to see a calculation here that would not result, in each entry, in a rounded number. The report does not explain the calculation or estimation that Penon made to arrive at the reported number. Additionally, this is inconsistent with the Florida Power and Light records which casts further doubt on the data in Penon's report.

The column entitled "tank water T max (Celsius)". This is the tank which feeds the E-Cat cells. It presumably is the large rectangular block in the center of Figure 2, on page 2/5 of Dr. Penon's final report. Fig. 2 has an annotation pointing to this block titled "probe for water temperature measure". This is also unremarkable.

The column entitled "effective flowed water (kg/d)", is the total mass of water transited during the test period. The pictures of the flow meter shows that it reads in m3, or cubic meters. This author wonders if the data logger converted cubic meters to kilograms or is it done in the spreadsheet. This author has the same concern with this column as with the column entitled "supplied energy wh/d" regarding the cell contents, i.e., seeing a rounded number in each cell as opposed to seeing a formula in each cell, or an explanation in the report as to how this number was calculated. In the vast majority of the cases, this cell content was 36000, not 35837, or 36714, but 36000 exactly. 27000 and 29000 were well represented also. This is undoubtedly the most uniform data collection which this author has seen in his forty plus years of engineering. There is no reason or need to round data to the nearest 1000 in a report like this. In fact, one needs to use the "Round" function in a spreadsheet to get numbers to display like this. This author has more comments on the water meter later in the report.

The column entitled "reduced flowed water (kg/d)" is described at the bottom of page 3 of the ERV report. "Measurement uncertainties have been present during the test. To take this into account the total mass of water transited during the test period has been reduced by 10%."

This column is simply 90% of the "effective flowed water (kg/d)" column. This author has the same concern with this column as with the "supplied energy wh/d" column regarding the cell contents, i.e., seeing a number in each cell as opposed to seeing a formula.

The column entitled "steam T min (Celsius)" is the measured temperature of the fluid leaving the E-Cat (This author has used fluid instead of steam intentionally. This will be discussed later in the report). The numbers themselves are unremarkable. What they actually represent is a different matter.

The column entitled "steam pressure" is the measured pressure of the fluid leaving the E-Cat (This author has used fluid instead of steam intentionally. This will be discussed later in the report). The numbers themselves are unremarkable. What they actually represent is a different matter. Every cell under steam pressure is "0" in the entire spread sheet.

The steam pressure in the "steam pressure" column is uniformly reported as "0.0" (bar). 0.0 bar is 0.0 atmospheres absolute. The way the data are presented the E-Cat is reported as operating in a perfect vacuum. If the ERV meant 1 atmosphere, the column should have been labeled "1 bar" or 0.0 (barg), (barg being bar – gauge). Another very serious data anomaly is that the steam temperatures are almost all reported as being over 100° C. The saturation temperature of water/ steam at atmospheric pressure is 100.0° C.

The column entitled "produced energy (wh)" is represented as being the energy produced by the E-Cat. The same comments about numbers in the cells versus formulas generally hold true for this column.

The "produced energy" numbers should have been generated and provided by a calibrated energy measuring device (to include steam flow, steam quality, temperature, and pressure) in the outlet of the E-Cat. However, there never was an energy measuring device in the outlet of the E-Cat, as shall be discussed in depth later in this report. Instead, the report raises suspicion that COP numbers (more on these later also) were not properly calculated, and the produced energy numbers may have been "back calculated".

With respect to the column entitled "COP", based on the above discussion, these numbers do not appear to have been properly calculated. If an appropriate energy measuring device had been installed in the outlet of the E-Cat, the "produced energy" column would be a tabulation of those actual readings. This value would then be divided by the "supplied energy wh/d" column, the actual supplied energy, to get the "COP". Which gets us to COP.

COP stands for Coefficient of Performance. It is a term which is used in the air conditioning and heat pump industry, not the steam producing and power generation industries. The most general definition of air conditioning and refrigeration is removing heat from a place where it is not wanted and rejecting it to a place where it will dissipate to the environment. The COP is a measure of how much work it takes to move a given amount of heat from point A to point B. The more efficient an air conditioner is, the higher its COP will be because it takes less work to move the heat from inside to outside. To use "COP" as a measure of the efficiency of a heat producing device (the E-Cat), as opposed to a work absorbing device (an air conditioner), is a misapplication of the term.

In summary, it is this author's professional opinion that the entire ERV spreadsheet is not a valid means to tabulate and compute the performance of the E-Cat. Its data are suspect and the methodology is not explained in enough detail to render the results valid, standing alone.

Test Instrumentation

The E-Cat test setup is briefly described by the ERV on pages 1, 2, and the top of 3. Figure 2 on page 2 purports to be a schematic of the test setup. With this setup, in the author's opinion it is not possible to accurately measure the output of the E-Cat.

The American Society of Mechanical Engineers (ASME), of which this author is a member, produces many Performance Test Codes for boilers and many other types of equipment. In the course of running one of these tests, numerous parameters which are delineated in the codes are carefully measured, one of which is the steam flow from the boiler. The steam flow, as well as its temperature, pressure, and quality in a saturated steam system are critical parameters to accurately measure and determine the actual BTU's per hour (BTUH) which the boiler is producing. Without knowing this, it is impossible to measure the performance and efficiency of the boiler.

The E-Cat is a boiler, albeit of unconventional design. Since it is a boiler, its efficiency can only be accurately measured by accurately determining its actual flow out of the unit, as well as its temperature, pressure, and steam quality, among other things. Steam quality is the percentage of steam in a given flow. A steam quality of 100% means that there is 100% steam in the boiler output and no moisture. A steam quality of 75% means that there is 75% steam and 25% moisture in the boiler output. Please remember that at a given temperature and pressure, there can be 100% liquid, 100% vapor, or any fraction in between, as was explained above.

By only measuring the temperature and pressure of the fluid leaving the boiler, there is absolutely no way of knowing how much fluid is flowing, and what the steam quality is. The E-Cat could have been producing 100% hot water, or 100 % steam, and no one would know the difference based upon the installed instruments.

It is this author's understanding that the E-Cat output line goes to an enclosed space which is or was occupied by JM Chemicals, or JM Products, or a similarly named entity. The return line from the enclosure to the E-Cat has a flowmeter installed in it. By any normal engineering standard, the flowmeter in the return line is measuring an input to the E-Cat. There is no way that this can be considered an output.[1] It is unknown what happens to the fluid inside the JM Products enclosure. Is it heated? Is it cooled? Is part of it drained off? Are city water or other substances added to the flow stream?

[1] Even if the flowmeter had been installed in the proper location, this author has serious concerns about the flowmeter's suitability for its stated purpose.

On page 3 of the ERV report, he states, "The measurement equipment has been placed and operates in a manner that is not necessary to study the client's use of the energy produced or even inquire about such use." This is not correct.

Back to thermodynamics, briefly. The reader should recall that a pound of 100% quality steam at 212° at atmospheric pressure contains more than five times the heat that the same pound of water (which is also 0% quality steam) contains at that temperature and pressure.

The point is that the E-Cat "system" could just as easily have been flowing water as steam. With the installed instrumentation, there is absolutely no way of knowing. Determining and establishing the whether the system was flowing steam would have been easy to do, if the person establishing the test plan was interested in knowing that data. If the E-Cat was in fact flowing water, and the output was not measured, but rather was only calculated, based on the assumption that the flow was steam, the calculated (not the actual) E-Cat thermal output would be exaggerated by at least a factor of five.

On page 4 of the ERV's report, is the equation:

$Ep = 0.9x\ \lambda \times Mw$
Ep is the total energy produced in the steam as shown on page 3, section 2.1
λ is the heat of vaporization (the heat it takes to boil water at a constant temperature)
Mw is the mass of water vaporized during the whole test, coming from the tank

The huge and unverified assumption built into this equation is that the flow out of the E-Cat is 100% quality steam. This equation, while technically correct, is not valid if the system is flowing water not steam. Again, there is absolutely no way of knowing exactly what is exiting the E-Cat.

Mr. Joe Murray addressed some of his concerns to the ERV concerning the flow meter. This author shares Mr. Murray's concerns and would like to see the ERV's responses. This author also shares the other concerns Mr. Murray has about the other issues in his letter, to wit: 2. The consistency of the reported flow rate statistics, 3. The number of reactor units in operation varied substantially over time, 4. System alteration on the night of February 16 or the morning of February 17, and 5. The flow of steam through the pipe to J. M. Products. This author reserves the right to address these issues at a later date.

It is this author's professional opinion that the E-Cat test setup was not properly instrumented and did not measure the E-Cat's actual output.

E-Cat Heat Rejection

For the sake of discussion (but not agreement, just to be clear), let us assume that the E-Cat produced all the heat that the ERV says it did, and that it was 100% quality steam. During the test period, the average assumed output from the E-Cat was about 790 KW.

E-Cat Output = (790 KW) x (3413 BTUH / KW)

2,696,270 BTUH

E-Cat Output = (2,696,270 BTUH) ÷ (33,465 Boiler HP / BTUH)
80.57 BoHP

Crosschecking:

E-Cat Output = (790 KW) x (1 BoHP / 9.803 KW)
80.59 BoHP

An 80 boiler horsepower (BoHP) boiler is a small commercial boiler. For illustration, below is a generic picture of a very common Cleaver Brooks steam boiler of this type.

This conventional boiler does not appear to be greatly different in size than the E-Cat.

The E-Cat is putting approximately 2,700,000 BTU's into the JP enclosure every hour. What happens to this heat? Please remember that the first law of thermodynamics states that neither matter, nor energy, can be created or destroyed, they can only change form.

If JMP was actually performing any processing, they would have taken the steam, used it to heat some materials to create or enhance a chemical reaction, or to heat materials to kill biologicals, or whatever other productive use would require 212° F (100° C) heat. The product stream would then have to be cooled for further processing, packaging, shipping, etc. In other words, all of the heat that entered the product stream would leave the product stream, either by air cooling, or by some sort of heat exchanger.

To illustrate, if one boils water (212° F) to make sweet tea and leaves the hot tea sitting on the counter, what happens to it? Does it naturally get hotter or does it eventually cool down to room temperature? We all know that it cools to room temperature eventually, even though it may take a while.

In an industrial process, the product cooling is accelerated by the use of heat exchangers or fans, or some other mechanical means of cooling. This is done to maximize the production rate and minimize the space required to do so.

In the issue at hand, let us first assume that air is used to cool the product stream. Please keep in mind that 2,700,000 BTU's enters the product stream every hour of every day of the test period (24/7). This same 2,700,000 BTU's per hour then leaves the product stream and has to be rejected to the environment.

Mr. Murray has produced some simulation videos purporting to show what happens to the temperature of the entire facility if one assumes (or contends) that the rejected heat was left to naturally dissipate in due course. This author has not verified Murray's numerical analysis, but only viewed the videos, and therefore reserves the right to verify Mr. Murray's calculations and analysis regarding this. The Murray videos show a very marked temperature rise in the space, with temperatures approaching 373° K (absolute temperature), which is 100° C, which is 212° F. This is warm, even for Miami.

If the unit were generating the amount of heat that Penon claims, and that heat had been left to naturally dissipate, no human could have worked, or even survived, for long in the space. Obviously, this temperature rise in the space never happened.

Alternatively, JMP could have used a roof-mounted fan to remove all rejected heat. Fan sizing is:

CFM = Cubic Feet of air per Minute
c = Specific heat of air in BTU per pound of air per °F (BTU / Lb. °F) = 0.24
ΔT = Temperature difference of the air, in this case 130° F - 80° F
ρ = Average density of the air in pounds per cubic foot = 14.3

$$CFM = (2{,}700{,}000) \times (1 / c) \times (1 / 60) \times (1 / 130 - 80) \times \rho$$
$$= (2{,}700{,}000) \times (1 / 0.24) \times (1 / 60) \times (1 / 50) \times 14.3$$
$$= 53{,}625 \text{ CFM}$$

A roof mounted fan to move this much air would have a blade diameter of about 54", a 10 HP motor, would have dimensions of about 60" square and about 48" high, and would look something like the next picture.

If most of the 2,700,000 BTUH were rejected to cooling water through a heat exchanger of some sort, the best way to remove the heat would be a cooling tower. Cooling towers are sized in tons of refrigeration or cooling. This refers to a ton of ice melting in a 24 hour period, not the weight of the equipment. A ton of cooling equals 12,000 BTUH.

Tons of cooling =	(2,700,000 BTUH) ÷ (12,000 BTUH / Ton)
Tons of cooling =	225 T

A cooling tower of this size would be about 12' x 12' x 12' and would look something like this.

The author has examined photographs of the site at 7861 NW 46th Street, Doral, FL, as well as aerial photos (below), and has spoken to Mr. Joe Murray, who inspected portions of the facility in February 2016. The author has seen no evidence that the plant contained any equipment resembling large rooftop ventilators or cooling towers. Aerial photos of the property are below:

Bing Maps

Google Maps

The author has seen no evidence of cooling towers. There are some squares on the roof which may be roof-top ventilators. Let's look inside the building.


Case 1:16-cv-21199-CMA Document 78-26 Entered on FLSD Docket 11/23/2016 Page 2 of 4


Case 1:16-cv-21199-CMA Document 78-26 Entered on FLSD Docket 11/23/2016 Page 3 of 4

Only the first interior picture shows anything in the ceiling. Since the rectangular opening is light, it could be a skylight or a natural (no fan) ventilation opening. A powered roof fan with a cap (a necessity in Miami) would not let any light through. The other photos show no openings in the ceiling.

The last interior photo, showing the dark grey partition with the white door is very interesting. As mentioned, no openings can be seen in the ceiling. Other than the small items along the left wall, there are also no visible pipes, pipe racks, pipe drops, conduits, cable trays, transformers, switchgear, motor control centers, storage racks, or any other items which one normally associates with a manufacturing facility, even a small one.

Is there any place else in the facility where 2,700,000 BTUH can be rejected? Another possibility might be to use city water to absorb the rejected heat. This author has analyzed the Miami-Dade water bills for the subject property and has determined that during the validation period, the facility used about 40,000 gallons of water. This is about 4.6 gallons per hour. For this discussion, assume that all the water was used for heat rejection, none was used for domestic purposes.

Assume: a 50° inlet water temperature, 130° water outlet temperature (sewer temperature restriction)
Flow is 5 gallons per hour.
Water density is 8.34 pounds per gallon.
Specific heat of water is 1 BTU per pound per degree.
Q is engineering shorthand for heat absorbed by the city water.

The formula is : Q = (gallons per hour) x density x temperature difference x specific heat
(5) x (8.34) x (130° F – 50° F) x 1.0

Heat absorbed by water = 3336 BTU per hour.

How much water under the same conditions would it take to absorb 2,700,000 BTU? Working the above equation backwards, it would take 4047 gallons of water per hour, or 67.5 gallons per minute to absorb this amount of rejected heat.

City water was not used for heat rejection.

Where did the rejected heat go?

Air cooling – no.

Cooling tower – no.

City water – no.

There are now but two alternatives left.

The heat just vanished. – no. The first law of thermodynamics prohibits this.

or

It never existed.

It is this author's professional opinion that the E-Cat never produced the energy which was claimed for it. This energy had to be rejected somewhere, and this analysis has shown, by the process of elimination, that the claimed energy never existed.

<u>Conclusions</u>

Based on the preceding and my more than forty years' experience as a professional engineer engaged in facility and utility engineering and operations, it is within a reasonable degree of engineering certainty that I conclude the following:

1. The Penon reports, standing alone, are not valid to tabulate and compute the performance of the E-Cat. The data are suspect and the methodology is not explained.

2. The E-Cat test setup was not properly instrumented and there was no measurement of the E-Cat's actual output.

3. The E-Cat never produced the energy which was claimed for it. This energy had to be rejected somewhere, and this analysis has shown, by the process of elimination, that the claimed energy never existed.

III. FACTS AND DATA CONSIDERED

In forming the opinions expressed in this report, I have relied on my education and experience as described in my curriculum vitae attached hereto as Exhibit A. In addition, I received and considered the documents and information identified in Exhibit B hereto.

IV. EXHIBITS THAT SUMMARIZE OR SUPPORT OPINIONS

I have not prepared any exhibits to summarize or support my opinion, other than as incorporated in the text of Section II above. I reserve the right to prepare exhibits in connection with my anticipated testimony at trial, after the completion of discovery.

V. QUALIFICATIONS

A summary of my qualifications is provided in the CV attached as Exhibit A, which includes a list of all publications I have authored in the previous 10 years.

VI. EXPERT WITNESS EXPERIENCE

Since January 2012, I have testified as an expert at trial or deposition in the following matters:

1. I provided my expert opinion in *Jerew v. Rhodes Heating*, Case No. 11-CV-0876, in the County Court for Marion County, Ohio, and testified at trial in December 2012.
2. I provided my expert opinion in *Akron Fairlawn Properties v. Edgell Plumbing*, Case No. 2012-09-5199, in the Court of Common Pleas for Summit County, Ohio, and testified at deposition and trial in October 2013.
3. I provided my expert opinion in *Richmond v. Sears Roebuck, et al.*, Case No. 12-CV-010718, in the Court of Common Pleas for Franklin County, Ohio, and testified at deposition in December 2013.

4. I provided my expert opinion in *Young v. First Energy*, Case No. 2013-CI-0408, in the Court of Common Pleas for Coshocton County, Ohio, and testified at deposition in April 2015.

VII. COMPENSATION

I am being compensated for my work in these proceedings at a rate of $275.00 per hour, except that y rate for deposition and trial testimony is $375.00 per hour. My compensation is not dependent on the opinions rendered or the outcome of this proceeding.

By: ______________________ 30 JAN 2017

Rick A. Smith Date

Respectfully submitted,

/s/ Christopher R.J. Pace

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Counsel for Defendants/Counter-Plaintiffs
Third Party-Plaintiffs

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing was served by e-mail on counsel of record this 30th day of January, 2017.

/s/ Erika S. Handelson
Erika S. Handelson

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EXHIBIT A

RICK A. SMITH, P.E.

7400 Brown Road
Ostrander, OH 43061
(740) 666-4872

PROFESSIONAL EXPERIENCE

JUN 1988 - PRESENT **APPLIED THERMAL ENGINEERING, INC.**

Principal of this specialty engineering firm whose forté is identifying and solving complex, intractable problems; industrial power plant engineering; utility generation and distribution; cogeneration; energy conservation and recovery; industrial process improvement; project design and management; forensic engineering and expert witness in the above specialties. Boiler, air conditioning, and pump instructor. Worked as a relief utility operator at a local R&D facility whose equipment includes two 750 HP, 250 PSIG boilers, an ammonia and a carbon dioxide refrigeration system.

Clients (direct or immediate sub) include:

- ALCON
- Anheuser - Busch
- ARCCA, Inc.
- ATT
- Cargill, Inc.
- Climax Molybdenum
- Ford Motor Company
- General Motors
- Georgia Pacific
- Graphic Packaging Int'l.
- Honda America Mfg.
- Johnson Controls
- Level 3 Communications
- Mead Paper
- Nestlé
- NIBCO
- Owens - Corning Fiberglass
- PPG Industries
- RIB USCost
- Ross Laboratories
- Spirax Sarco
- State of Arkansas
- State of Ohio
- Strategic Value Solutions
- The Ohio State University
- Thomson Consumer Elec. (RCA)
- US Dept. of Justice, BOP
- Volcanic Heater
- Numerous law firms internationally
- Numerous smaller companies

Please see last page for representative projects.

OCT 1983 - JUN 1988 **THE OHIO STATE UNIVERSITY**

Senior Mechanical Engineer:

- Successfully managed a $7,000,000 steam line expansion project which encompassed 30,000 feet of superheated steam and condensate lines, several major road crossings, a river bridge crossing, and 15 building tie-ins / system upgrades, all on a crowded urban campus. Project management entailed:
  - Oversight of consulting engineers.
  - Review and approval of all plans, specifications, and change orders.
  - Coordination and liaison with all affected University departments.
  - Installation coordination and oversight.
  - Resolving conflicts between this and other ongoing projects.
  - Minimization of disruption to all University operations.
- Spearheaded a $2,300,000 cogeneration project in McCracken Power Plant. Authored the feasibility study which withstood a peer review by outside consultants; overcame significant technical and political hurdles; supervised design, specification, procurement, and installation of the 3125 KW non-condensing turbine generator, and all associated piping and auxiliary equipment.
- Assisted in the completion and startup of a 125,000 pound per hour coal fired boiler and its associated flue gas scrubber system.
- Assisted in the preliminary needs assessment and scope of work development for a medical waste incinerator.
- Earned the Mechanical Engineering Advanced Professional Degree.

NOV 1981 - JUN 1983 **CUMMINS ENGINE COMPANY**

Facilities project manager for maintenance and engineering at five large buildings. Provided engineering services for an additional twenty-five buildings, totaling over 1,000,000 square feet.

Major accomplishments:

- Converted three boilers to dual fuel capability to minimize fuel costs.
- Analyzed major electric accounts. Through a transformer purchase, brought a major facility into a lower rate structure, saving thousands of dollars annually.

JUN 1979 - OCT 1981 **ALUMINUM CO. OF AMERICA**

Mechanical engineer in charge of energy conservation for a large aluminum extrusion plant. Provided engineering services for the boiler house and billet annealing furnaces.

Major Accomplishments:

- Initiated closing the doors of the homogenizing furnaces between loads to conserve energy and reduce furnace turnaround time. Zero cost, very large annual savings.
- Discovered and engineered a heat recovery project for an aluminum chip dryer.
- Designed and built a new boiler ash handling facility. Performed major equipment enhancements.
- Analyzed the condensate return system in search of a solution to a vexing problem only to find that the difficulty was caused by a faulty control valve diaphragm.

JUL 1977 - MAY 1979 **PURDUE UNIVERSITY**

Project engineering including design and installation of retrofit HVAC systems on campus.

JUL 1976 - JUL 1977 **ARMOUR - DIAL, INC.**

Project engineer, then maintenance supervisor at a large soap manufacturing plant.

LICENSES

PROFESSIONAL ENGINEER: Ohio STATIONARY ENGINEER, 3rd CLASS: Ohio

UNIVERSAL REFRIGERATION TECHNICIAN: USEPA

STEAM SYSTEM SPECIALIST: USDOE

QUALIFIED AS AN EXPERT IN U.S. AND CANADIAN COURTS

MILITARY SERVICE

OCT 1968 - AUG 1972 UNITED STATES MARINE CORPS

Parris Island - 1968. Completed Officer’s Candidate School at Quantico in 1969. Volunteered for and actively participated in Viet Nam as an artillery forward observer.

EDUCATION

OHIO STATE UNIVERSITY: Mech. Engineering Professional Degree, 1988.

PURDUE UNIVERSITY: BSME, 1976. Member - Pi Tau Sigma.

PROFESSIONAL AFFILIATIONS

MEMBER - American Society of Mechanical Engineers

PUBLIC SERVICE WORK

MEMBER - Columbus District Heating Task Force, 1984 - 1986

MEMBER & PAST COMMANDER - American Legion Post #115, Delaware, OH

COMPUTER EXPERTISE

Proficient in all Microsoft Office applications as well as AutoCAD. Have received extensive training in the use and integration of all these products. Can learn any other package as required.

REPRESENTATIVE ENGINEERING PROJECTS

- Corrected excessive gas consumption in an asphalt drying plant.
- Performed a gas line capacity and cathodic protection study for a glass blowing plant.
- Performed boiler house, steam, and condensate studies at various plants.
- Performed engineering design reviews and assisted with depreciation studies.
- Performed project engineering for an energy center upgrade.
- Performed cogeneration studies for a major university and a major auto manufacturer.
- Wrote standard air compressor specifications for a major food products company.
- Designed a steam reducing station for a large paper drying machine.
- Resolved HVAC problems in a paper mill machine room air conditioning system.
- Performed a cooling tower study for a large brewery.
- Re-engineered the heating system for a bottle washing tank at a large brewery.
- Confirmed the sizing of refrigerant and steam piping.
- Walked down and re-drew the chilled water piping at a large auto assembly facility.
- Walked down and re-drew the ammonia PID's for a large food R&D facility.
- Performed a compressed air study at a large steel mill.
- Performed a cooling study for a large natural gas pipeline compressor.
- Performed a boiler safety audit at a large food R&D facility.
- Perform Coast Guard / ASME design review and certification for thermal fluid heater manufacturers. Developed a complex, interactive Excel based program to perform the calculations.
- Have assisted in value engineering studies for the VA and the City of New York.

TRAINING EXPERIENCE

- Have taught hundreds of boiler, HVAC, and pump classes for American Trainco, Applied Thermal Engineering, Lewellyn, NTT, and Versa-Tech in the US, Canada, and the Caribbean.
- University of Wisconsin - Engineering Extension, Industrial Boiler Controls Course Presenter.
- Taught ME 625, a dual level course in Power Plant Engineering, while at Ohio State University.

REPRESENTATIVE FORENSIC / EXPERT WITNESS PROJECTS

- Steam line failures and explosions.
- Pressure vessel explosions.
- Boiler explosions, both fire side and water side.
- Boiler failures – non explosion.
- Pump and valve failure analysis.
- Coal supply issues.
- Cogeneration system failure.
- Atmosphere oven explosions.
- Carbon monoxide accidents and fatalities.
- Water meter failure.
- HVAC compressor failures.
- Hydro testing explosion.
- Large diesel engine cooling system failure.
- Boiler refractory failures.
- Investigate cooling tower freeze failure.
- Hot water burns / scalds.

PUBLISHED ARTICLES

- "Winter Storm Warning, NBBI *Bulletin*, Winter 2012, Volume 67, Number 1.
- "75-Ton Bottle Rocket Case Study", NBBI *Bulletin*, Fall 2012, Volume 67, Number 3.

EXHIBIT B

EXHIBIT B

1. The Complaint and all exhibits thereto [D.E. 1]

2. The Third Amended Answer, Additional Defenses, Counterclaims and Third-Party claims, and all exhibits thereto [D.E. 78]

3. The E-Cat MW1 Energy Plant in Miami Tests Plan, IH-00011128

4. Initial Queries for M. Eng. Fabio Penon as to Measurements of 1MW Plant, IH-00011086

5. Documents produced in response to subpoena served on Florida Power & Light Company, INDUSTRIALHEAT_FPL000004-000067

6. Documents produced in response to subpoena served on Miami-Dade Water and Sewer, INDUSTRIALHEAT_MDWS-0001-0049

7. The E-Cat MW1 Energy Plant in Miami Energy Multiple Evaluation Final Report by Fabio Penon, IH-00079630-79658

8. Fulvio Fabiani's Electric Data, produced in discovery by Fulvio Fabiani on or about January 13, 2017 on an unlabeled flash drive.

9. Fulvio Fabiani's Thermal Data, produced in discovery by Fulvio Fabiani on or about January 13, 2017 on an unlabeled flash drive.

10. Fulvio Fabiani's MW1-USA System Absorption Data (translated to English)

11. A video and photo of the flow meter time lapse conducted by Joseph Murray

12. Videos of the heat simulation conducted by Joe Murray

13. Photos taken by Joseph Murray at the Doral Location

14. Joseph Murray's October 31, 2016 Power Analysis

15. Photos taken in December 2014 at the Triangle Drive Facility, produced by Defendants in discovery as part of the three terabyte hard drive (Folder: 3 Triangle Drive>2014-12>Images)

16. Photos of the E-Cat and related equipment taken by Andrea Rossi, produced in discovery by Andrea Rossi on a thumb drive labeled 00000002.

17. Rossi's Testing Data, produced in discovery by Andrea Rossi in native format as ROSSI_00001075, ROSSI_00008579.

18. Industrial Heat spreadsheets summarizing data collected from Florida Power and Light

19. Industrial Heat spreadsheet summarizing the data from Penon's final report

20. Telephone interviews with Joseph Murray

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

ANDREA ROSSI and LEONARDO CORPORATION,

Plaintiffs,

vs. No. 1:16-cv-2119-CMA

THOMAS DARDEN; JOHN T. VAUGHN; INDUSTRIAL HEAT, LLC; IPH INTERNATIONAL B.V.; and CHEROKEE INVESTMENT PARTNERS, LLC,

Defendants.

INDUSTRIAL HEAT, LLC and IPH INTERNATIONAL B.V.,

Counter-Plaintiffs,

vs.

ANDREA ROSSI and LEONARDO CORPORATION,

Counter-Defendants,

and

J.M. PRODUCTS, INC.; HENRY JOHNSON; FABIO PENON; UNITED STATES QUANTUM LEAP, LLC; FULVIO FABIANI; and JAMES BASS,

Third-Party Defendants.

HIGHLY CONFIDENTIAL

Videotaped Deposition of JOSEPH ALAN MURRAY
(Taken by Plaintiff)
Raleigh, North Carolina
Friday, February 17, 2017

EXHIBIT "C"

Reported in Stenotype by
Lauren M. McIntee, RPR
Transcript produced by computer-aided transcription

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

ANDREA ROSSI and LEONARDO CORPORATION, Plaintiffs,	)
vs.	) No. 1:16-cv-2119-CMA
THOMAS DARDEN; JOHN T. VAUGHN; INDUSTRIAL HEAT, LLC; IPH INTERNATIONAL B.V.; and CHEROKEE INVESTMENT PARTNERS, LLC, Defendants.	)
INDUSTRIAL HEAT, LLC and IPH INTERNATIONAL B.V., Counter-Plaintiffs,	)
vs.	)
ANDREA ROSSI and LEONARDO CORPORATION, Counter-Defendants,	)
and	)
J.M. PRODUCTS, INC.; HENRY JOHNSON; FABIO PENON; UNITED STATES QUANTUM LEAP, LLC; FULVIO FABIANI; and JAMES BASS, Third-Party Defendants.	)

HIGHLY CONFIDENTIAL

Videotaped Deposition of JOSEPH ALAN MURRAY
(Taken by Plaintiff)
Raleigh, North Carolina
Friday, February 17, 2017

Reported in Stenotype by
Lauren M. McIntee, RPR
Transcript produced by computer-aided transcription

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ON BEHALF OF THE PLAINTIFF:
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ON BEHALF OF THIRD-PARTY DEFENDANTS FULVIO FABIANI, AND UNITED STATES QUANTUM LEAP, LLC:
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255 University Drive
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rnunez@acg-law.com

ALSO PRESENT:

MR. MICHAEL KIRBY, CLVS
DR. ANDREA ROSSI

VIDEOTAPED DEPOSITION OF JOSEPH ALAN MURRAY, a witness called on behalf of Defendant, before Lauren M. McIntee, Registered Professional Reporter and Notary Public, in and for the State of North Carolina, at CaseWorks Court Reporting, 3509 Haworth Drive, Suite 403, Raleigh, North Carolina, on Friday, February 17, 2017, commencing at 8:50 a.m.

INDEX OF EXAMINATIONS

INDEX OF EXHIBITS

THE VIDEOGRAPHER: We're on the record at 8:51 a.m. This is the videotaped deposition of Joseph Murray in the matter of Andrea Rossi, et al, versus Thomas Darden, et al. This deposition is being held in the offices of CaseWorks at 3509 Haworth Drive, Suite 403, in Raleigh, North Carolina 27609 on February 17, 2017. The court reporter is Lauren McIntee. The videographer is Michael Kirby, both with Caseworks. Would counsel please introduce themselves.

MR. ANNESSER: John Annesser and Brian Chaiken on behalf of the Plaintiffs.

MR. LOMAX: I'm Christopher Lomax on behalf of the Defendants.

THE VIDEOGRAPHER: And would the court reporter please swear in the witness.

MR. NUÑEZ: Hello there. This is Rudy joining in.

MR. ANNESSER: Thank you, Rudy. We've already begun.

MR. NUÑEZ: Okay.

MR. ANNESSER: Please place us on mute.

MR. NUÑEZ: I thought it was 9:00 though, right?

MR. ANNESSER: Yes, but we, we decided to start just a couple minutes early. Just put us on mute if you would.

MR. NUÑEZ: Okay. No problem.

JOSEPH ALAN MURRAY,

having first been duly sworn, was examined and did testify as follows:

EXAMINATION

BY MR. ANNESSER:

Q. Mr. Murray, my name is John Annesser. I represent the Plaintiffs in this matter as you know. Have you had your deposition taken before, sir?

A. I have had a deposition taken before, yes.

Q. Okay. When was that?

A. Between 1998 and 1999.

Q. Okay. I'm going to give you a quick refresher for depositions. Our court reporter here is going to take down everything we say. With that being the case, I'm going to do my absolute best not to interrupt you or talk over you in any manner. I would ask you to do the same for me as it makes her job nearly impossible. During the course of the deposition I'm going to be asking you a series of questions, none of which are intended to embarrass or harass you in any manner. They are simply to get to the facts in the matter of this case.

If I ask you a question and you do not understand it, please let me know that and I will try to either restate it or rephrase it. If you do not ask me or do not tell me that you don't understand, I'm going to assume that you do understand. Is that fair?

A. Yes.

Q. Okay. At any time if you need a break, just let me know and we'll try to get to, to a break at the next available opportunity. Are you represented by counsel today?

A. Yes.

Q. And who is your counsel?

A. Chris Lomax of Jones Day.

Q. Does he represent you individually, or does he just represent the Defendants in this matter and you believe yourself to be part of that group?

A. He represents the Defendants and, therefore, me in some capacity as a witness.

Q. Okay. Are you current -- are you currently employed --

MR. LEÓN: Francisco Leon here.

MR. ANNESSER: Okay. Francisco, we've begun already.

MR. LEÓN: Okay.

MR. ANNESSER: Thank you.

BY MR. ANNESSER:
Q. Have you retained Mr. Lomax individually?
A. No.
Q. Are you currently employed by any of the defendants in this case?
A. No.
Q. Okay. Can you please state your full name for the record?
A. My name is Joseph Alan Murray.
Q. And what is your home address?
A. 2646 Saint Marys Street, Raleigh, North Carolina 27609.
Q. Your business address or addresses?
A. I have a home office now at my home address. And I also have an office that's under construction at 5107 Unicon Drive, Unit K in Wake Forest, North Carolina.
Q. Are you currently employed?
A. I started a new business after Industrial Heat shut down.
Q. Industrial Heat is shut down?
A. They ceased to have an engineering operation, so they let all of the engineers go.
Q. What do you mean they ceased to have an engineering operation?

A. So we had a group of, I don't know, five or six engineers that were working at the company. And as effective the end of October, they gave all of the engineers a severance package and released us, paying us through the end of the year. And then subsequently we had to agree to support their ongoing activities, as-needed basis for pay if needed.

Q. Have you provided any services to Industrial Heat after October 2016?

A. Yeah. Obligated to from October through December, and I did I would say very little. And then in January there were a few questions, and then this month in preparation for the deposition there were a lot more questions.

Q. Okay. What was the amount of your severance package?

A. It was pay and benefits through the end of the year, so for November and December. It did not include any leave on the books. That was just terminated.

Q. The question was how much.

A. How much money?

Q. Yes.

A. I, I don't know, two months worth of salary.

Q. What were you being paid at Industrial Heat?

A. $200,000 a year.

Q. What benefits did you receive?

A. Medical, 401(k), short-term, long-term disability, leave. Probably a few other things. Oh, there was a life insurance policy, kind of a standard life insurance policy.

Q. Now, you said that you've started your own new business?

A. Yes.

Q. What's the name of that business?

A. 0 Base Design.

Q. What does it do?

A. Engineering services. I'm writing SBIR proposals, working with some other primarily defense-related companies.

Q. I'm sorry. SBI proposals?

A. SBIR. Small business innovation research contracts.

Q. What is that?

A. It's a, it's a small business contract that the federal government offers to anybody. It's an open solicitation. They occur anywhere from one to three times a year by all of the various groups within the department -- within the federal government.

Q. Okay. Now, you said you did engineering services. What engineering does this new company provide?

A. Mechanical engineering, systems engineering, system architecture, design type work.

Q. Okay. What is, can you define those for me? What is mechanical engineering as opposed to systems engineering?

A. So mechanical engineering is normally the, the study of mechanical designs and elements, the creation of designs, fluid mechanics, thermodynamics, heat transfer, various other elements. System design is normally a broader multidisciplinary function that includes mechanical engineering, electrical engineering, computer engineering, overlooking large systems that may encompass functionality from all those areas.

Q. What engineering projects have you worked on since starting this business, 0 --

A. Base Design.

Q. -- Base Design?

A. I have been working on nanocomposite thin film coatings with another company for automotive and reverse osmosis desalinization proposals. I have been working on a proposal for an unmanned aircraft. I have worked on proposals for coatings associated with unmanned autonomous vehicle engines. I have worked on

some simulation work related to helicopter applications; specifically, rotor blade interaction with, with particulates in unimproved landing and takeoff sites.

Q. Okay. Now, you said you've worked on proposals for these things?

A. Yes.

Q. What do you mean by a proposal for these things?

A. So in most of these areas you have to propose the work, get -- gain funding, and then have the work put on contract before you can actually get the work.

Q. Have you gained funding for any of those projects?

A. We have, I have one that has been awarded. The contract not has actually -- that's not true. Yes, I have one that has been awarded. The contract actually just came in this week. And another one that the contract is due in the next few weeks, the contract has been awarded. They're just putting it through, the money through on the vehicles.

Q. So as of this date, you have worked on the proposals, but you have not done the actual engineering or mechanical engineering or systems engineering side of the project, correct?

A. No. The proposal process involves an

extensive amount of engineering to submit with the proposal to be selected and made eligible to be awarded.

Q. What is your job title at 0 Base Design?

A. Principal.

Q. How many employees does it have?

A. Two.

Q. Who is other than yourself? I assume you're one of the two?

A. Yes.

Q. Okay. Who is the other employee?

A. My wife.

Q. Okay. Is she an engineer?

A. No, she's not.

Q. What does she do?

A. She's doing administrative.

Q. So you're the only engineer with the company?

A. At this point, yes.

Q. Have you ever provided expert testimony before?

A. No.

Q. Have you ever been determined to be an expert by any court?

A. No, not that I'm aware of.

Q. What do you bill for your services?

A. What do I bill?

Q. Yeah. How much?
A. An hourly rate? 150 or $175 an hour.
Q. What are you being paid, sir, for your services that you're providing to Industrial Heat now?
A. $175 an hour.
Q. Is your company, 0 Base Design, part of any professional organizations?
A. No.
Q. Are you part of any professional organizations?
A. Not presently.
Q. Have you been within the last three years?
A. Yes.
Q. Which organization?
A. I have been a member of ASME, a member of SPIE, the Society of Photographic and, and Imaging Engineering, and the American Physical Society.
Q. What is ASME?
A. American Society For Mechanical Engineers.
Q. Why are you no longer a member of that?
A. Just because I, I changed addresses and never renewed at my new address.
Q. Okay. What about the society for -- I'm sorry, SPIE?
A. Yeah. The, I, I am no longer doing imaging

systems. And so I used to go to conferences and participate in a lot of those, but I'm not doing that anymore.

Q. Okay.

A. So I no longer am a member.

Q. I'm sorry. The last one was?

A. The American Physical Society.

Q. Why are you no longer a member of that?

A. Just no longer participating in the conferences and proceedings.

Q. Now, you said that you have testified before. What type of case was that back in '98, '99?

A. There was a dispute between a, a company that manufactured, that built a software compiler technology and a company who licensed their technology. And I had written a proposal for the U.S. Army to actually use the same technology, and we licensed that technology from the supplier. And they were suing each other, the other two companies, and I was asked my opinion about the maturity of the technology and the usefulness of the technology.

Q. So you gave opinion testimony in that case?

A. Yes.

Q. Were you offered as an expert witness in that case?

A. I don't know. It's been so long ago.
Q. Do you recall the name of the case?
A. No. But I, I could probably find it.
Q. Okay. Do you know where the case was pending, what court?
A. Probably in Cleveland I would guess. I lived in Washington, D.C., at that time, but I'm not sure.
Q. Do you know if it was a federal or a state case?
A. I do not.
Q. Do you know who the attorneys were in that case?
A. I do not.
Q. What was the name of the company that you had provided testimony for?
A. I don't even recall. They were a small company. I, I know the engineer's name that ran the company, but I would have to look at, back at my notes.
Q. Other than that, have you ever provided deposition or trial testimony?
A. No.
Q. Sir, can you tell me starting with high school, well, let me just start there. Where did you go to high school?
A. I went to high school at Swartz Creek High

School in Swartz Creek, Michigan.
Q. Did you have any area of study there, or was it just general academia?
A. It was college prep and technical studies, so I studied drafting and design.
Q. Did you pursue a degree after high school?
A. Yes, I did.
Q. And what degree did you pursue?
A. I went to Michigan State University and received a degree in mass -- in mechanical engineering, a bachelors of science in mechanical engineering.
Q. Any specialty area or just generally mechanical engineering?
A. I spent most of my specialization in heat transfer, fluid mechanics, turbulence, and thermodynamics.
Q. Did you get a, does your degree reflect your studies in heat transfer and fluid mechanics?
A. No.
Q. Those were just courses that you took?
A. Actually did, I was, I took courses in that area, and then I worked in a research laboratory at the university.
Q. Okay. How long did you attend Michigan State?

A. I was at Michigan State University from August of 1986 until May or June of 1991.

Q. So almost five years?

A. Yes.

Q. You graduated with a degree, sir?

A. Yes.

Q. And you said you were, you worked in research at Michigan State?

A. Yes. So throughout my undergraduate education, I came from a very large family. We didn't have the resources to go to college, so I worked as a co-op engineer throughout. So I would go to school one quarter, and I would go to university another quarter. So in general I worked the winter and summer quarters, and I went to school the fall and spring. So I worked at General Motors Truck and Bus throughout my undergraduate, and then during the semester I worked in the fluid mechanics and turbulence research laboratory.

Q. Fluid mechanics and turbulence?

A. Research, yes.

Q. And what did you do there?

A. Conducted experiments and measurements in turbulent flow systems, supported the graduate students to a large degree doing experiments.

Q. Okay. Now, after Michigan State did you pursue any additional degrees?

A. **Yes. I, also I, I studied as an undergraduate, when I was at Michigan State I studied abroad at the Rheinisch-Westfälische Technische Hochschule in Aachen, Germany. So in 1989 I spent about five or six months at RWTH studying abroad. And then subsequent to that I went to the University of Utah and received a masters degree, a masters of science in mechanical engineering where I specialized in fluid mechanics and heat transfer research.**

Q. Does your degree reflect heat transfer and fluid mechanics?

A. **No. It's a masters of science, my degree. All of my publications reflect the research area.**

Q. Okay. I'll ask about your publications in a couple.

A. **Okay.**

Q. Did you receive a degree from the University of Utah?

A. **Yes, I did.**

Q. What year was that?

A. **1993.**

Q. And for that degree did you have to write a thesis or a dissertation?

A. **No. I did the publication option, so I wrote**

papers and presented at ASME conference. There were two options.

Q. How many papers did you publish for that degree?

A. I believe I had two publications.

Q. What were they called?

A. Oh, I can't recall.

Q. What were they on?

A. They were on, the research I was doing at that time was in conjunction with the Army Dugway Proving Grounds. We were doing near-wall turbulence measurements. And the Army had a desire to use a technology called sonic anemometry to make --

(Phone ringing.)

A. Excuse me. I apologize. Forgot to turn that off. Let me just disable this. I'm sorry. There we go.

So my research was, the Army had a desire to do, to make turbulent measurements using a technology called sonic anemometry in the atmosphere; in particular, on the, the salt flats in the Utah desert. And one of the challenges was that the actual physical structure of the sonic anemometer interfered with the flow and, thereby, interfered with the, the fluid structure inside the measurement domain. So we did a

very extensive study of the, the turbulent structure and turbulent flow inside the sonic anemometers.

Q. Okay. You say an extensive study. How long did that take?

A. Probably worked on that for about a year.

Q. Full time?

A. Yeah. It was my research program.

Q. Okay. That was one of your publications?

A. Yes.

Q. What was the other?

A. The other one, my advisor and I worked on analysis of some of his thesis data. He was, he received his PhD and did his post doc at Michigan State. And I, he and I did measurements and a lot of analysis of his data, and that was published in the Journal of Fluid Mechanics.

Q. What was his thesis on?

A. Sub-grid scale turbulent measurements.

Q. Did you take any courses either in your masters program or bachelors program in nuclear engineering?

A. No.

Q. Did you take any power plant designs or power plants?

A. Yes.

Q. Okay. What courses?

A. As an undergraduate I was required to take two thermodynamic courses, which were fundamentally focussed on power plant design and steam systems. I also took two heat transfer courses that were requirements, and a lot of that was on heat, heat exchange for steam and other types of systems. And I took two fluid mechanics courses as an undergraduate.

In my masters program I took a conductive heat transfer graduate study class, which included a lot of study of conductive heat transfer in both steam and gas systems. I took a gas dynamics course in graduate school. The gas dynamics were focussed on turbine and gas dynamics. I also as an undergraduate took a class on gas and steam turbine design.

And then subsequent to my masters, in my PhD program I took classes on viscous flow, which also incorporated aspects of turbulent flow in these types of systems. And I took a viscous flow class in, in my -- all of my graduate work was effectively focussed on fluid mechanics, heat transfer, and turbulent flows.

Q. Now, the three courses that you took, thermodynamics, heat transfer, and fluid measurements in undergrad, those were required courses?

A. It was heat transfer, two classes in heat

transfer; two classes in thermodynamics; and two classes in, in fluid mechanics.

Q. Yes, sir.

A. Thermodynamics.

Q. I believe you said that those were required courses?

A. Yes, yeah. Required.

Q. And so everyone who got a mechanical engineering degree took those courses?

A. Absolutely.

Q. Okay. What about your masters? I believe you said conductive heat transfer and gas dynamics. Were those required courses?

A. No. I also took a viscous flow course in my masters program as well.

Q. And in a hundred words or less, what is viscous flow?

A. Viscous flow is the flow of liquids in either internal flow or external flow systems in looking at the actual structure of the flow and the losses in the flows, in 100 words or less.

Q. In your undergrad or masters program, did you receive any honors, prizes, fellowships, or otherwise?

A. Yes.

Q. And what were those?

A. I graduated with honors as an undergraduate. In my graduate program I had an NSF fellow for one of my research years through my advisor, and then in my --

Q. What is an NSF? I'm sorry.

A. National Science Foundation fellow. So my advisor received a Young Investigator grant. I think now it's called a Young Investigator. Back then I don't know what it was called, but. And with that, he was given funding, research funding to have an NSF fellow work for him, and I received that for one year in my masters. And then my first year in my PhD program I received funding under a NASA fellowship, the same type of thing through my advisor.

Q. Okay. So the advisor was awarded the grant money, and you were selected as the fellow to, to --

A. To do the research.

Q. Okay. Post masters degree did you pursue any additional degrees?

A. Yes.

Q. What degrees?

A. PhD in mechanical engineering.

Q. Were you awarded that degree?

A. No, I was not.

Q. Why not?

A. We were living in Washington, D.C., and my son was born, and I had to get a job that paid enough money to pay for my family. So I left my PhD program after I was advanced to candidacy and was completing my thesis. The company I went to work with agreed to give me half time to complete my thesis work and defend my thesis, but it just never happened. They became too emersed in the work and never was able to complete my dissertation.

Q. Okay. What was your thesis on?

A. My thesis was on sub-grid scale physics for large eddy simulations, the relationship to energy cascades, and dynamic modeling of the sub-grid scales.

Q. And in laymen's terms that means what?

A. So there are, in general there are three general forms of large scale simulations for turbulent flows and for heat transfer. One is a Reynolds-averaged technique, which is what's commonly used for things that you might see on the news or the weather. The second technique is called a direct numerical simulation. Since then I should note there's another whole emergent technology, but I won't get into that.

Direct numerical simulation, the problems are that, the problem with the direct numerical simulation is that you can only do very, very trivial, small problems because of the computational resources it

takes. It's a Fourier transform of the Navier-Stokes equation. The solvers are extraordinary. So in the 1960s it was proposed that if you took a step kind of halfway between the two extremes and you solved the Navier --

Q. Too much.

A. Too much information?

Q. You're, you're actually confusing me more than when I began that question.

A. Yeah.

Q. So let me retract that for a moment.

A. Okay.

Q. During your time, whether in your undergrad, your masters, or your PhD program, did you ever teach courses?

A. Yes.

Q. What courses did you teach as an instructor?

A. I was, I taught a laboratory on fluid mechanics measurement in my masters program as a teaching assistant. And I taught a laboratory on, it was compressible flow. So it was a supersonic flow, basically running the supersonic wind tunnel.

Q. Wind tunnel you said?

A. Yeah, wind tunnel.

Q. Have you prepared or presented any

professional seminars?

A. **Excuse me. Meaning presentations?**

Q. Presentations to other people in your field.

A. **Yes. Yes.**

Q. And how many of those have you prepared and presented?

A. **I have presented at ASME conferences in the '80s. I presented at the Division of Fluid Mechanics annual meetings at the American Physical Society in the '80s. I don't remember the exact year. I remember one was in Atlanta and one was in San Diego, and one of them I remember distinctly because it was disproving the fundamental tenants of my thesis, so.**

Q. I'm confused, sir. You, you said that --

A. **'90s, I'm sorry. '90s, early '90s. It was in my masters program when I did ASME presentations related to the sonic anemometers. And, and then Division of Fluid Mechanics meetings were in, let me think, '94 and '95, about those, that time frame. Could have been '96.**

Q. Were there any publications affiliated with those presentations?

A. **Yeah. Actually, I think the, the actual presentations are published through American Physical Society for the Division of Fluid Mechanics, and the**

ASME I believe are also published. You can find them online.

Q. Have you, do you -- I'm sorry. Do you have any continuing education requirements?

A. No.

Q. Have you taken any continuing education courses or otherwise --

A. Yes.

Q. -- in your field?

When is the last time you took one?

A. November.

Q. And what was that course in?

A. I was, it, within the last year I took two courses on a simulation technology called OpenFOAM. It's a new emergent 3D-simulation technology used for fluid mechanics and heat transfer, and I've been actually attempting to use it for about six or seven years. I tried to get my engineering team to use it some years ago, but I never had the time or the resources, so in the last year I've had training twice on that.

Q. Okay. So they were both on that?

A. Yes.

Q. How, okay. You said that was training. Was it a continuing education course or just training on that software?

A. I don't know if I could differentiate between the two. What, what do you mean?

Q. Were you, was it presented by the software company?

A. Well, it was, there was -- yeah. Actually, it was one of the developing companies that does it. They offer training for these courses.

Q. How long were the courses?

A. The first one was three days. I'm sorry. No. The, the first one was two days. The second one was three days, and it also included one day for a, a forum where people came from around the world and presented their research on this tool.

Q. I'm sorry. What was the tool called again? Open phone?

A. OpenFOAM.

Q. O-P-E-N?

A. FOAM, F-O-A-M.

Q. F-O-A-M?

A. Uh-huh.

Q. Is that a software that you can purchase?

A. It's actually freeware. You can download it.

Q. Sir, do you hold any licenses or certifications?

A. **No.**
Q. Do you have an engineering license?
A. **No.**
Q. Are you a professional engineer?
A. **No.**
Q. Have you ever applied to become a professional engineer?
A. **No.**
Q. Have you ever applied for any other license or certification?
A. **No.**
Q. Now, I'd like to walk through your employment history prior to 0 Base Design.
A. **Okay.**
Q. I'm sorry. When did you begin working with 0 Base Design?
A. **I formed the company I think the first week of November 2016.**
Q. Prior to that where were you employed?
A. **Immediately prior to that I was employed by Industrial Heat.**
Q. What was your title there?
A. **Vice President of Engineering.**
Q. And when did you begin working as Vice President of Engineering for Industrial Heat?

A. About May of 2015.

Q. As an employee?

A. I began in May of 2015 as a, being paid as a consultant because of my medical insurance, to carry my medical insurance over to the end of the year from my previous company.

Q. And I'm going to come back obviously to --

A. Yeah.

Q. -- your time at Industrial Heat, but prior to working for Industrial Heat, beginning in May 2015 where were you employed?

A. I was employed by a company that I had started in 2003. The name of the company was 3 Phoenix, and we sold that company to a British publicly traded company called Ultra Electronics in February of 2014, and I was one of the co-founders and principal in that company.

Q. How many co-founders were there?

A. There were five co-founders.

Q. What did that company do?

A. We built systems for the Department of Defense. We built radar systems. We built A -- engine -- let me see. We built radar systems. We built sonar systems. We built imaging systems, a number of different imaging systems. We built test systems for

torpedos, heavyweight torpedo, it was the Mark 710 system to test the torpedos. We did a lot of innovative research contracts as well, SBIRs.

Q. Okay. What do you mean by you built systems such as radar systems? Were you building radar towers? Were you designing --

A. No.

Q. -- the system?

A. So our role at 3 Phoenix was primarily, when the Department of Defense had a challenging problem and a, and a very limited amount of time to get it done, they would often hire us to build the system. So they would have a set of requirements; for example, we need a certain range resolution or other technical requirements. We would document those requirements. We would design both a physical hardware and software system to address those requirements.

We would build EDM, engineering development model, prototypes of that system. We would test those systems with our Department of Defense customers, and then we would do low-rate initial production typically. And that's typically when we would end. Some systems have gone on since then to a full-rate production, but we would typically end at low-rate initial production.

Q. Okay. Now, when you say you built these systems, is that for, are we talking about designing them on paper and saying, hey, guys, this is how you build your system, or is this actual physically constructing --

A. We did everything.

Q. -- the system?

A. Yeah. We, we, we developed the requirements. We went through requirements reviews with our customers. We turned those requirements into designs, and normally we would go through what's called a preliminary design review and then a, a final design review or critical design review. It depends on the customer. After, between the preliminary and the critical we begin to develop prototype elements; in particular, risk reduction areas where they might be high risk. We develop either software to hardware or address that. And then after critical design review is finished, we would actually build the system, physical hardware and software.

Q. What were your job duties at 3 Phoenix?

A. I was, as I said, I was a principal and co-founder. And I wrote a lot of proposals. I designed a lot of systems. I was a chief system architect. I oversaw the analysis and validation of the system against the requirements.

Q. Did the U.S. government require that the design systems or the engineering be signed off by a professional licensed engineer?

A. No.

Q. Did you have professional licensed engineers working for you?

A. No.

Q. What were you paid while you were with 3 Phoenix?

A. I was paid, well, at the beginning we started in my basement, myself and two other principals, and we were paid zero. And my salary once we began to make money was I believe $165,000 a year. All the principals had the same salary, and gradually over the 10-year period my salary went up to I think about 310,000 or $320,000 per year. And that was my, my salary. We also had bonuses and other aspects of compensation.

Q. Now, you said you sold the company in February 2014?

A. Yes.

Q. How much did it sell for?

A. We sold the, the total value of the sale was, was really in three parts. There was money up front, which was $70,000,000. There was $10,000,000 of retention bonus, and then there was an additional

$7,000,000 of earn-outs if the company met their, their objectives. So the total value of the sale was $87,000,000.

Q. And what was the portion you received?

A. About 20 percent. This is maybe 12 or $14,000,000.

Q. Now, were you retained by the company that purchased that business for any period after it was sold in 2014?

A. Yes.

Q. For how long?

A. I left after about 15 months, but I left, they, they preferred that I would have stayed, but I was just, between the due diligence process and the integration process, I was just tired in the end, needed to take a break.

Q. So --

A. So I left in April 2015.

Q. And when you left what was your salary?

A. 300 whatever, whatever I said before. 315,000, 320,000. I don't really recall. Per year.

Q. And you left on your own accord?

A. Yes.

Q. And you said that they asked you to stay?

A. Yes.

Q. What did you do -- did you go directly from 3 Phoenix to --

A. Yeah. That wasn't the plan.

Q. -- Industrial Heat?

A. But that's what ended up happening. My, my plan was that I was going to take about six months and just not do anything, but. And when I decided to leave 3 Phoenix I had been in discussion, I had, actually I had lunch with Dewey Weaver. And he said, you know, this group he's working with, Industrial Heat, they're ramping up and they need to set up an engineering operation, would I be interested. And I said I might be. And he said, well, they're getting money to set this up and, and so, you know, let me know if you're interested. And I said, okay, I would be interested.

And my presumption was, like everything I had done for the previous 20 years with the Department of Defense, that anytime somebody says they're going to get money, it always takes six months longer, so I didn't think it would be an issue. And then so it turns out that as soon as I had left 3 Phoenix, it was not, it was within a week or two that they called and said we received our funding and we need to get going.

So I, I worked just at arms lengths for a little while, just saying I'll help you out, get

organized, get things, you know, in place that you need to get in place, and then became fully engaged there in about, you know, mid to late May.

Q. We'll come back to that. Prior to 3 Phoenix where were you employed?

A. I worked for Digital Systems Resources, which in September of 2003 was bought by General Dynamics Corporation. And I was at Digital Systems Resources from May of 1996 until September -- I'm sorry, until December of 2003 I believe. About.

Q. Now, what was your title or role at Digital Systems Resources?

A. When I, when I started there I was a systems engineer working on acoustic systems. Acoustic systems have a lot of similarity to a lot of the mechanical systems that I was working on in my PhD studies. Excuse me. And so I started as a system engineer on a program called MARS, the Multistatic Active Receiver System and then rapidly progressed up in my title. At the end ultimately was Director of Strategic Technologies.

Q. Now, you said you left there around December of 2003?

A. Yes.

Q. Why did you leave?

A. So after, we were a, we were a smaller

company. When I started at Digital Systems Resources we were about 65 people and we grew the company to be about 500 people, and then we were bought in 2003 by General Dynamics. General Dynamics was a perfectly good company. They're a great company, but they operate in a very different way than a small dynamic company. And it was clear that the innovation and the speed and some of the things that we had brought to the table were not going to continue within the, the General Dynamics family. So I decided that I needed to go back to an environment where we could do innovative system development.

Q. All right. Now, you said they worked on acoustic systems?

A. They, they actually built all kinds of systems.

Q. Okay.

A. Yeah. They worked, they, their biggest program was a program called ARCI, the Acoustic Rapid COTS Insertion. It was a very innovative program injecting technology into the submarine fleet. I worked on ARCI. I worked on a program called APB, Advanced Processing Build. I worked on a program called Tech Insertion. I worked on a program called Weapon Control. I worked -- WC. TC, Tactical Control. I worked on the

MARS systems. I worked in the Tech Insertion Photonic Mass Workstation. I worked on CEC, Cooperative Engagement Capability. I worked on TSM, Total Ship Monitoring system. I was overseeing the architecture and the development of that system for 688 submarines, Seawolf submarines and Virginia Class submarines. The list goes on. We did a lot of programs.

Q. Did that company work at all on power plants?

A. Did they work -- no, they did not.

Q. Did 3 Phoenix work on power plants?

A. We worked on power systems.

Q. What is a power system, sir?

A. So --

Q. And, and before you answer I'm going to ask you to give it to me at a third-grade level. I took two science courses in college, and I may have slept through one of them.

A. Okay.

Q. So.

A. So we, we built systems that took in very large high voltage and, for example, AC 483 phase or shipboard power, 2160 3-phase power, things of that sort, kind of the stuff you would see in like big industrial applications. And we built systems that converted that or transformed it into power appropriate

for systems like acoustic transmitters or radar systems. So we built 25-kilowatt power systems, and we built, we actually designed preliminary design and proposed a, a 1-megawatt power system for the Arleigh Burke cruisers for their new radar system that they were building.

Q. Arleigh Burke cruisers, what is that? I'm sorry.

A. It's a, it's a United States Navy surface vessel. It's a cruiser, a mid-sized attack vessel.

Q. Okay. And so the system you built would be contained within that ship?

A. Yes. Most of the systems were actually for aircraft carriers. It was part of a system called the TWS, Torpedo Warning System, which is an active transmit and receive acoustic system for detecting torpedo attack on aircraft carriers and then localizing the incoming torpedos and then firing countermeasure weapons. We built that entire system.

Q. Now, when you say you proposed this 1-megawatt system, that was receiving one megawatt of energy and then, for lack of a better term and I'm probably using it wrong, diverting that energy into the different systems that would operate based on it? Is that --

A. Yeah, converting it.

Q. Converting.

A. So it, it brought in what we would describe as dirty power --

Q. Okay.

A. -- directly from the turbine gensets, brought in that dirty power and filtered it, cleaned it up, and it converted from AC 2160 VAC, very high current, into 1-megawatt total output. And then that one megawatt went into actually another switching system that tran, that, that broke it up into pieces and put it out on the individual elements of the radar.

Q. Okay. So your, your work with that project was, after you had received this dirty power as you put it, it, your work on that did not include the production or generation of that power?

A. No.

Q. Okay. Have you ever worked on a system with respect to power generation or the, the production of that power prior to Industrial Heat?

A. Yeah, not directly in the production. I worked, when I was at General Motors I worked on a program in the steam plant. The actual steam generation was a central facility, and I worked in a facility that, that was a joint customer of the steam plant. So this was a very large General Motors facility with three

major plants, and in that plant we received and we had to pay for steam. And so one of my projects was actually, in the management of that steam, specifically looking at the instrumentation and reducing cost associated with that, the steam plant.

Q. Okay. And that was while you were an undergrad?

A. That was when I was a co-op engineer, yes, at General Motors.

Q. In your undergraduate program --

A. Yes.

Q. -- right? What was your title at General Motors?

A. Intern engineer.

Q. Did you work under other engineers?

A. Yes.

Q. Who was ultimately responsible for making recommendations for determinations in that position?

A. For, for that program?

Q. Yes.

A. The, the supervisor of plant engineering.

Q. What was his name?

A. I don't recall.

Q. Did you work directly for the supervisor of plant engineering?

A. Yes. During that program, yes.

Q. And how long were you with GM in that position?

A. As an intern engineer I was there, let's see, one, two... about six or seven quarters. We were, Michigan State was on a quarter system at that time. Approximately.

Q. Less than two years?

A. No. More than two years. So all the way through my, so -- that's probably, yeah, total, aggregate, yeah, about two years.

Q. Okay. And was that full time or was that part time?

A. It was full time on the quarters when I wasn't at school. So I would go to school in the spring and fall, and then in the winter and summer I would work full time.

Q. Okay. And that was in what years?

A. I began at GM Metal Fab Truck and Bus in, I think it was about 1987. I think it was the Summer of 1987, was my first co-op intern quarter.

Q. Have you worked in a steam plant since then?

A. Not a steam plant, but many plants that, in fact, almost every system I worked for, worked on in the Department of Defense was a chilled-water cooled system.

So we kind of had the opposite problem. We had to take the heat out of the systems and dissipate it to the chilled-water systems on ships or submarines or their platforms.

Q. Now, you said you designed these systems. Did you actually work on them or work on designing systems? Are we talking about actually being in these plants and these facilities, or are we talking about designing them on paper?

A. At General Motors I was actually in the plants.

Q. No, I understand that.

A. Oh.

Q. I'm talking about after that.

A. Oh, the Department of Defense systems?

Q. Yes.

A. Yeah. We actually designed them on paper. We built them. We deployed them. I spent time on ships, submarines. We had to install them. We had to support the -- in the Navy there's an entire organization called HM&E, which is the hull machine group. And they have to approve your installations and make sure that all your documentation is current. So we would work with them and we would work on the installations and all the testing and validation,

independent testing. Most of the systems had to go through an independent validation test.

Q. How would you remove heat from the water?

A. It was actually the other way around.

Q. I'm sorry.

A. We were removing, we were removing heat from the systems to dissipate it to the water so the ships or submarines could, could manage it in a very controlled and, and very quiet way, effectively was the key. So we would use heat exchangers in our rack enclosures, were pretty typical.

And we would normally be allocated a budget of flow rate, temperature and pressure, and a maximum pressure drop across the system. We would use heat exchangers, and then we would do a lot of design work to actually flow the air inside the cabinet through that. And then we would also have a budget for allocation to the chilled-water system as well as allocation to the, the open space around the racks. So we had, it was a very careful dance because the chilled-water systems had limited capacity on the ships.

Q. Okay. What is a rack enclosure?

A. Oh, so the systems in most military applications are enclosed in a rugged rack, so like a, a cabinet, if you will, with a door. And inside of it you may have a bunch of electronics or specialty hardware sensors, other things, and then you would have a heat management system, so heat exchanger system. And then the chilled water would flow in, in a, in the case of a chilled-water system, and out. And then there would also be allocation to the space. So the rack itself is like a ruggedized enclosure, computer enclosure for shipboard applications.

Q. Okay. And that's where the chilled water would be heated presumptively by --

A. By the system, yes.

Q. -- by the system. Okay. How long, I'm sorry. How, how large were these rack enclosures?

A. Well, it depended on the system. For example, on the AN/SPS-74 radar, periscope detection radar system we built for the aircraft carrier, that system had two large racks. So they were, I think they were probably 30 inches wide, 30 inches deep, 6 feet tall, each of those two racks. But other systems like ARCI, the Acoustic Rapid COTS Insertion, the TC and WC, they might have 20 racks in a system or even more. It just depends on the system.

Q. And how much heat was transferred?

A. In each one of those systems?

Q. In each one of those systems.

A. It depended on the, the budget allocation of a system. So typically in a system like that, each of the functions, depending upon mission criticality of the function, would have a certain allocation of sea water or, I'm sorry, of chilled water. And so very critical systems would have a larger allocation to ensure that they operated within their, their, their temperature range, whereas less critical systems would be, have the ability to be disabled during critical, mission critical events or evolutions.

So it really depended, but some of them were 10 kilowatts. Some of them were higher. The power solution that we, the radar power solution, that was a 1-megawatt system. And the most difficult requirements associated with that system was, in fact, the chilled-water requirement because in that 1-megawatt system we were only authorized to, to put somewhere between 40 and 50 kilowatts of power into the chilled-water system, which meant that our power conversion had to be extraordinarily efficient.

Q. 40 or 50 kilowatts over what period of time? Is that kilowatt hours per hour or is that --

A. So we have to be very careful. People often confuse the use of power and energy. So the unit of kilowatt is 1,000 watts, and a watt is the joules per

second. The unit of energy is the joule. So energy per second is watt. So when you say kilowatt hours, what that is, is it's joule scaled be 3,600. So a kilowatt hour is a unit of energy, whereas a kilowatt hour per hour, the hours cancel and it's actually a unit of power. So we have to be careful.

So, and it's very important -- I know a lot of people think this is nit-picking, but it's very important to know that because in a system, if you have a pulse of power, and a lot of the systems we built were pulsed, you may have a lot of power in a very short period of time, but your average power over some long period of time might be very low. And so you have to be able to design to accommodate for these, these changes in power. So power and energy is very important to understand the differences there.

THE VIDEOGRAPHER: Guys, we've got five minutes.

Q. Okay. So you said there was a 1-megawatt system?

A. Uh-huh.

Q. How much, correct me if I'm using these incorrectly. How much power was put into that system per hour? Is that --

A. Okay. So that, it depends upon the duty

cycle of the system. So in the case of that system, which was the design that we prepared, that system had a, a power input of one megawatt, but then it had a duty cycle on top of that. So it might operate at a certain number of pulses per second. So the aggregate power or the aggregate energy used in an hour would be lower than the cumulative, say, 1-megawatt hour. It would be a lower value. And I don't recall off the top of my head what the duty cycle for that particular system was required to be.

Q. How large was that system?

A. Oh, it was, that was a big system. I think that that system was proposed as -- the prototype, the EDM phase was proposed as two ISO containers, so 20-foot conex boxes. And, and that may have included the, the actual test apparatus. Because to manage that level, that's an extraordinarily high amount of power for that kind of density, so to manage that much power you really have to be very careful. So we had to have loads to dump the power, and we had to have special infrastructure to load it in. Our partner on that program was a company called Dynapower, and they had some of those resources available.

Q. When you say dump the power, what do you mean by that?

A. So when you're testing a system, in a case of a system like this, what you need to do is you need to be able to verify all of the requirements of the system are met, but you don't usually do that with a potentially hundreds-of-millions-of-dollar radar on the back end. You do it in a test configuration.

So what you do is you would have an interface to, for example, grid power. And you would condition that power to look like the genset power that would come in on the ship. And then the output load that would normally go to the other system for distribution of the radar, you would dump it into something that emulates that. So it would absorb all that power and allow you to measure it and determine what's happening, the quality, and does it meet the requirements, does it meet the duty cycle, does it meet the thermal requirements, the heat transfer, all of those other things as well as in those systems a huge focus is on reliability and mean time between failure.

Because the systems are so large, you actually had have to cut a hole in the ship to get them in, and generally people don't like to do that. Those are, you know, those are very, very expensive operations. So to get them in and out, you need to --

Q. So that particular system that you worked on, the 1-megawatt system, the heat transfer was from dry heat, not steam, or was it?

A. No. The heat transfer in, in the, in that proposed system was actually from the power electronics. So what we were doing was we were taking 4160 high current power and we were conditioning it and switching it into DC power, so we were making 1,000 volt DC at a very high current. And so to do that, what you had to do was you had to put it through switching electronics like silicon carbide and gallium arsenide and other technologies for switching that power.

And when you switch that power, there are inefficiencies in those semiconductors, and so they dissipate heat. Some percentage of that heat or some percentage of that power gets converted to heat, waste heat. And so you had to remove that power from that area so it didn't melt and turn the, the entire switching apparatus into just a puddle of molten semiconductor.

Q. Okay. So when you say one megawatt of power that's going through, that's not the amount of heat that's being released; is that correct?

A. No. If you released that amount of heat in a space that small, you would melt and destroy everything.

Q. Okay. And that was cooled you said by cool

water or that was --
A. **Chilled-water system.**
Q. -- chilled-water system?
A. **Yeah, system, the ship chilled-water system. Yes.**
Q. Okay. Have you ever worked on any plants that involved heat exchangers that are air cooled?
A. **Air to air? What, what do you mean?**
Q. Well, and maybe I'm using it wrong, but where the heat dissipation is done by air flow as opposed to using chilled water.
A. **Well, all of those systems had heat exchangers. And so in any kind of a heat transfer system you're normally transitioning heat from a gas to either another gas or to a liquid. And so the direction of the heat transfer is dictated by the direction of the Delta T, so it's the same system.**
Q. I'm sorry. Maybe I didn't understand. When you use the term heat --
A. **Yes.**
Q. -- is that a gas?
A. **No. Heat is, heat is energy, and it's typically measured by a temperature difference. So when there's a temperature difference, there's a diffusive process that transmits the heat through materials. It**

could be a gas. It could be a liquid. It could be a solid. It could be a plasma. Any of the four normal states of matter. And so in a heat exchanger normally what you're doing is you're transferring heat from a hot side to a cool side. And whether that hot side is in the water or that hot side is in the, in the gas, it doesn't matter. It's just the direction of the heat transfer.

Q. Okay. So in the, in the example of the 1-megawatt plant you did for the DOD --

A. Yeah. That was a proposed plant, yes.

Q. So it was releasing heat into a fluid system, correct?

A. Yes. It was transferring heat into a fluid system.

Q. Okay. So --

A. And heating that fluid.

Q. So heat from the air presumptively to --

A. It was from the semiconductor, the, from the solids.

Q. Okay.

A. That gets transferred through very sophisticated heat transfer devices into the chilled-water system, yes.

Q. Okay. We'll take a short break here.

THE VIDEOGRAPHER: We are off the record at 9:52 a.m.

(Recess taken 9:52 a.m. to 9:58 a.m.)

THE VIDEOGRAPHER: We are back on the record at 9:58 a.m.

BY MR. ANNESSER:

Q. Sir, to continue our discussion on that 1-megawatt plant for the DOD that you had been previously discussing. So if I understand it correctly, as you said before, you were transferring heat from these solid-state conductors and whatnot equipment to liquid --

A. Yes.

Q. -- correct? So you were going from a solid state to a liquid state?

A. Uh-huh.

Q. What is the mathematical computation for that? How do you determine how much heat is being transferred?

A. I don't recall off the top of my head. That's a complicated analysis.

Q. Okay. Do you happen to know what the computation is to go from a gaseous state to a solid?

A. The heat transfer?

Q. Yes. From gas to a solid.

A. Again, it depends upon the, the details of the system, how you transfer the heat. So there are three primary modes of heat transfer. There's radiative heat transfer. There's conductive heat transfer, which typically is solid to solid, and then there's convective heat transfer. So if you were going from a, a solid to a gas, the primary mode in lower temperature Delta Ts would be convection heat transfer. And then depending upon the temperature differential, you could get into radiative, but it's, those are detailed analyses that you have to look at on a, kind of a design-by-design basis.

Q. Okay. And you don't know sitting here today what, how you would go about doing that?

A. It depends on the system and the details of that system.

Q. It's been a while since you've done that I take it?

A. Well --

Q. That was back in --

A. Yeah. It depends on the system. I mean you just have to look at each one of the systems and look at the details specifically.

Q. When was the last time you did that type of calculation?

A. The heat transfer calculation?

Q. Yes.

A. I did some for Industrial Heat in the fall for various types of systems. Actually, that, what year is this? This is 2000 -- primarily we were looking at different types of heat transfer for the various investments between let's say the Fall of 2015 to the Summer of 2016.

Q. And what were those heat transfers? Were they from -- was that conductive heat transfer?

A. It depends. There were three primary areas of investment that Industrial Heat had made. And my job, being in charge of engineering, was to, was really twofold. We were to validate and verify each one of the investments and then, any of the investments that merited reproduction, then we would do an independent reproduction of that.

And so each one of the systems was very different because there were electrolytic systems, there were plasma-based systems, and then there were solid-based systems. So every one of the systems had nuanced differences, and each one of the inventors and technologists, they all came up with all their own schemes for calorimetry and measurement of that heat transfer.

Q. Of all the systems you tested in Industrial Heat, were there any that you were able to validate and verify?

A. No.

Q. Why not?

A. We went through, the process was we worked with the inventors. So there were, as I said, I don't remember if there were five or six different groups, probably name them. What we did was we went to work with each one of the investments, and we looked at all of the data that they were willing to share with us. Almost all of them were completely transparent and open. We went to their labs. We worked with them. We collected their data, and we looked at it. We analyzed it. And in many cases the heat that they were producing, the excess heat, the anomalous heat was very small. They, they had amounts that were very small. And so any small errors in their sensor systems or small errors in their assumptions would mask that level.

So we went through and carefully analyzed their data, and in a few cases we actually reproduced their experiments. We had two groups that in the validation verification phase we came up with what I would describe as nebulous results. They weren't positive, but we certainly just couldn't say here is a

major problem that has to be overcome before we could legitimately verify and validate it. And so in those cases we worked very closely with the inventors and organizations to help them do independent reproduction in our lab.

Q. Okay. And those were successful reproductions?

A. No. Ultimately, the reproductions, yeah, we didn't find anything that had excess or anomalous heat.

Q. Okay. And what were those two?

A. What were those two?

Q. Yeah.

A. If --

Q. You know, who were the inventors?

A. The first one was Dr. Mizuno in Japan. That was a plasma-based system. And the second one, which was very much at arms length, I did not have privy or access to this one, was HMRI. It was a, it was only a partial investment into it. And so I was kind of, me and the rest of the engineering team were kept at arms length. We weren't allowed to have access to all of their data, so I just got summary reports and briefings on some of the things they had done.

Q. I thought you were able to reproduce their experiments in your lab.

A. So, yeah. No, we, what we did was, based on the limited knowledge we had of their system, we reproduced an electrolytic cell that to the best of our ability looked like what we had understood they were doing. And we could not achieve the same results that they were giving us at this kind of arms length.

Q. Okay. What about Dr. Mizuno? Were you able to identically reproduce what he was doing?

A. No, we were not. So Dr. Mizuno had conducted a, a series of these plasma-based technique tests in his lab in, in Sapporo, Japan. And so myself and some of the other engineers went to Sapporo and looked at his test apparatus and, and looked at his data. He was very forthright, shared all of his data, everything he had with us. There were some challenges just because of his physical environment. He had a very small lab. He didn't have good control over the environmental conditions in the lab.

And so we had some reservations, but he had some results that were just anomalous. We couldn't quite understand them. So what we did was we didn't notice that during his testing he -- and I should note, you know, he's a, he's a wonderful person, but I should note that he was one person and an assistant. He didn't have a lot of people to help him. So what we found was

that in the middle of his experimentation or kind of towards the tail end he had changed a piece of equipment. And so that was a concern, because you never want to see in the middle of a test somebody changing a piece of equipment. You could introduce all kinds of problems.

So what we did was we worked with him to go back to his experiments, instrument them with a much more robust instrumentation set, and then re, have him reproduce the experiments exactly as he had before. And once we re-instrumented the, the equipment and put a little better controls in his lab on the environmental conditions, we couldn't get the same result again. And that was in his lab.

Still, the, the senior management at Industrial Heat, they, their view was if any of these technologies have even one percent probability of success, they want us to go all the way to the end to find if anything works, because they were very eager to, to find something that was successful. And so, so at that time we didn't see results. So what we did was we set up an independent test of Dr. Mizuno's in our lab, and we completely replicated his system and we followed his recipe. We couldn't get it to work.

And so then Dr. Mizuno sent over a system

that he had prepared for us and brought it to our facility, and then he came over and he spent, I don't know if it was a week or ten days, he spent some time in our lab setting that up and going through his process that he had defined to validate it. And we, and there were some nuances. I mean between the translation between Japanese and English, and there were some nuances that he highlighted while he was there that were subtle differences, but we did his exact procedure and process on his reactor in our facility, and we still were not able to do it.

So, so our concern, you know, our conclusion was that the one set of data where he had changed some instrumentation was indeterminate. We couldn't make head or tails of it, but we were not able, in any of the series of experiments, able to produce that result, so.

Q. Why was it necessary for him to come over and do the experiment in North Carolina as opposed to just relying on the one that you had built?

A. How do you mean?

Q. Well, you said you, you constructed it based on his formula, his, his design and tested, and it did not produce results.

A. Right.

Q. So why then did you have to have him come over and test it again?

A. Well, because Mr. Darden was, wanted us to drive to the end, that if there was even one percent chance that that one measurement he did was correct, then let's get to the bottom of it. And there was a big language barrier. So what we did was we had him, after we were able using all of his information, able to reproduce it or not able to reproduce it, what we had him do was we had him to come over and use one of his reactors in our facility to see if there was something, some nuance difference that we just weren't getting, and then try to reproduce it. But we were not able to get it to work even with him there.

Q. Would you say that it is essential to work with the inventor in order to make sure that you're getting absolutely everything to attempt to replicate these tests?

A. In my opinion, yes. I mean if, these are very nuanced and subtle areas. And so if you don't have access to, to these people, it's very difficult to really understand all of the, the small nuance differences.

Q. Did you ever try to reproduce or test an E-Cat device designed by Dr. Rossi?

A. I did not.

Q. So you've never tested an E-Cat device?

A. We created a device that was as close as possible to the best of our ability without, without the ability to communicate with Mr. Rossi. We, we did the best we could. So we created some reactors that were similar to some of the reactors that he had tested at the Triangle Drive facility before I was part of Industrial Heat, and we tested those systems.

Q. Okay. Now, you said a couple things there I want to ask you about. You said with no communication with Dr. Rossi?

A. Uh-huh.

Q. Why didn't you have communication with Dr. Rossi?

A. Well, so when I came on board, so in June of 2000 -- let me get the year right -- 15, Industrial Heat was, had just received their funding. I don't know if it was in April or May. They had received funding, and they were in negotiations for several other investments. And so those were ongoing, and the lawyers, you know, not to say anything bad about lawyers, but the lawyers were doing their thing. And so they were taking a long time to kind of get to the point where we could really engage and work with the various groups.

So in June of 2015 Tom Darden and John

Mazzarino asked me to look at in detail what Mr. Rossi was doing. So I took all the information that, that they could provide me, and it was insufficient information incidentally. There were, there were no red-line drawings of the plant. There were no details. And on top of that, this is another kind of detail, Tom Darden was the keeper of the trade secrets. Nobody else knew anything about the details of the fuel technology.

So what we did was we focussed on the heat transfer and the coefficient of performance as they had been defined so that we could figure out if we could replicate it. Because Tom and John insisted that if there's even one percent chance he's right, they want to move ahead and figure out how to do this.

So in 2000 -- June of 2015 I went through everything I could find. And, and there were some commissioning reports I think they were from Mr. Penon. And I was going through those, and there were a lot of typos and errors, and so that was concerning. And so I developed a whole bunch of questions. Like, for example, in the commission report they had the flow rate in the system was 36,000 -- let me think of the unit -- kilograms per day, day after day after day, which I thought was suspicious, but in the body of the text he had written 3,600.

So I thought, oh, 3,600 would be a lot more logical. It was kind of consistent with what everybody was describing as the coefficient of performance, those types of things. So I thought, okay, well, maybe there's an error there. Maybe it's just a simple typo. I mean somebody could have transposed a number. That's not a big deal. Things happen.

So we went through all of that. And I was looking at it. I just couldn't figure it out because I couldn't figure out where, in a thermodynamic sense where the various sensors were. Because you have to have the pressure and the temperature and the volume or mass flow rate of the condensate return, and you need the pressure and the temperature and the volume or mass flow rate of the steam to, to measure the system.

Q. I'm going to stop you for just a minute.

A. Okay.

Q. We will get into that. I'm going to give you plenty of --

A. Okay.

Q. -- opportunity to tell me about it.

A. Okay.

Q. But I want to go back to the testing that you did.

A. Okay.

Q. Okay. So the question again was why you had no communication with Dr. Rossi.

A. Right. So that was where I was getting to. So at the end of that analysis -- thanks for reminding me because I'm out in the weeds. At the end of that analysis I just couldn't make heads or tails of what was going on, so JT Vaughn and Tom Darden and John Mazzarino said you need to go down and meet with Mr. Rossi, understand what he's doing, look at the plant. He said if we don't have the documentation, at least you can look at the plant and understand what's going on. I said fine, I'll go down and meet with Dr., with Mr. Rossi.

So in July of 2015 we were going to fly down and visit him. And I don't know exactly what happened, but JT had informed Mr. Rossi we were coming down and he, he said I couldn't come to the building. So that kind of put up a big barrier. And so subsequently what we did was we, I engaged with Barry West, and Barry West was on leave or vacation. I think it was in August time frame. He would, I think he would work five weeks and take a week off or maybe work four and take two. I don't remember what the details were, but he was back up in North Carolina, and I met with him to get some details to try to figure out what was going on.

Q. Okay. Now, going back for just a minute to your testing. Well, first of all, in that time period, and I understand JT Vaughn sent an e-mail to Dr. Rossi as you explained. Did you ever send an e-mail to Dr. Rossi?

A. I don't believe I ever did, no.

Q. Did you ever introduce yourself to Dr. Rossi?

A. First time I met him was actually the day that you and I were at the plant for the first time.

Q. Okay. Did you have any preconceived notions about Dr. Rossi when you met him?

A. Yeah. I would say yes, I did.

Q. And what were those notions?

A. Mr. Darden, Tom Darden and John Mazzarino, they engaged with me directly and said, look, you just have to be aware that he's very deceptive, and you just have to be careful with that. And I said I'm only about the data --

Q. When did they tell you that?

A. -- and so. I think after the meeting was canceled in July, that, about that time frame.

Q. Did they tell you that that meeting was likely not going to go over well with Dr. Rossi?

MR. LOMAX: Objection to the form of the question.

A. **I don't, what --**

Q. Did they ever tell you that, you know, just them even suggesting that you come down is probably going to upset Dr. Rossi?

MR. LOMAX: Objection to the form of the question.

A. **I, I don't know. I, I would have anticipated that, based on their relationship as it was kind of presented to me, that, you know, there would be some, some reception actually at that time, because Mr. Darden and others were taking other people down there to look at the plant and talk to them, and so I thought I was just going to be another person to visit.**

Q. Okay.

A. **So.**

Q. Did they ever tell you he would be upset by your visit, but, you know, to do it anyways?

MR. LOMAX: Objection to the form of the question.

A. **I don't recall, but they may have. They may have indicated that. It may have been after though that, once he actually said you can't come in. I don't remember the exact time line that all of that happened.**

Q. Now, just back for a second with Mr., and I'm sorry, Dr. Mizuno. So is it your belief that his testing protocol that was undertaken at his lab in Japan was faulty?

A. I believe that the test protocol that he executed in Japan prior to us being able to go in and inspect what he was doing did have errors and, and problems, yes.

Q. To your knowledge, did Industrial Heat invest in Dr. Mizuno's technology?

A. To my knowledge I believe, and I'm not deep into this, my understanding is that we paid him kind of a monthly stipend to, to support his research and development activities.

Q. To your knowledge, has Industrial Heat sued him?

A. I am not aware of that, no.

Q. All right. Now, sir, taking a large step back from what we've been discussing. When did you first come into contact with Industrial Heat?

A. When did I first come into contact with Industrial Heat or with the personnel associated with Industrial Heat?

Q. Well, let's go ahead and say the personnel.

A. Okay. So I met Dewey Weaver --

THE VIDEOGRAPHER: Mr. Murray.

THE WITNESS: Oh, I'm sorry. Sorry about

that.

A. I met Dewey Weaver probably ten years ago. I'm estimating. One of Dewey Weaver's colleagues was a, was an engineer that worked for me starting in probably around 2007, and I met Dewey Weaver at that time. Subsequent to that, some years later, and I don't remember exactly the time period, Dewey always was trying to figure out a way that we could work together and then he -- oh, go ahead.

Q. I'm sorry. Is --

A. Go ahead.

Q. Is Dewey Weaver an agent of Industrial Heat --

MR. LOMAX: Objection --

Q. -- to your understanding?

MR. LOMAX: Objection to the form of the question.

A. I don't know what that means. What do you mean by agent?

Q. Was he acting on behalf of Industrial -- you, you started off by saying, you know, are we talking about the, the people at Industrial Heat.

A. Right, right.

Q. And then you went into Dewey Weaver. Is he one of the people at Industrial Heat --

A. At, at --
Q. -- to your understanding?
A. At this time before, long before I had ever heard of Industrial Heat, he was just a, you know, kind of an entrepreneur working on various different things. At some point along the way he became what I would describe as an independent business development person for Industrial Heat.
And so I think about the time line of about 2012 Dewey actually engaged with my former employee, Bill Moscrip, who is unfortunately passed away, to see if Bill could help them understand some of this research that was going on in this area. And, and Bill, actually I don't know if he looked at it or he didn't do it, but Bill came to me to get permission as an employee of mine to make sure that that was okay. And I said, yeah, that's absolutely fine. You can do, you know, that's, it's completely outside of the, the realm of anything that we're interested in at 3 Phoenix.
So Bill was going to work with Dewey. And then Dewey became aware that we had bid on and won a program called the Mark 710. The Mark 710 is a heavyweight torpedo test program. It tests live weapons for heat transfer, power generation, cooling, acoustics, engine performance, everything, every single component

of the live weapon. And it's a, it's a very sophisticated test apparatus.

And so Dewey became aware of that. And he said, hey, we're doing some research, and we may need some sophisticated test equipment and test capability and test engineering capacity. Would you guys be willing? And I said as a, as senior executive at 3 Phoenix, I said certainly we would be interested in bidding on it or at least understanding it.

So sometime in 2012, and I don't recall if it was once or twice, and I don't know if it was 2011 or if it was 2012, you know, thereabouts. Tom Darden and JT Vaughn and Dewey Weaver, I think on the first occasion it was Tom Darden, JT Vaughn, and Dewey Weaver, came to understand what our capabilities were in this instrumentation and test space. So I kind of gave him an overview of the things that we were doing, gave him a tour of our facility, showed him the laboratory spaces, showed him, you know, kind of our engineering capacity, showed him our production spaces.

Subsequently they came back. I don't know if it was a month or three months later or six months later. Just at some point in the future they came back, and that time they bought -- they brought T., T. Barker Dameron along with them. And so we, we then gave them

an update and said, you know, this is our capability. These are the types of systems we're building. And we had very robust capability in that space.

And they wanted to know if we were capable of building a test and instrumentation system for a reactor type of system like this. And I said, yeah, it's actually very similar to a lot of other things that we work on, so we'd be more than happy to, to bid on it.

Q. And when was that?

A. I want to say 2012.

Q. Okay.

A. I don't know if it was summer or when. At about the same time, I have to caveat that, at about the same time we were going through the sale of our company. We were working with M&A, and so my work load at that time was pretty extraordinary. So I don't remember the exact dates, but there about that time frame. And they sent me some information on Mr. Rossi's background, and I commented on it and said, yeah, you know, this is the type of thing we could analyze. I said I really have no idea what this technology is, but at the end of the day we don't really care what the technology is. If it produces heat, then you can make it useful.

Q. Okay. So among the things that they sent you, you said something about his background?

A. About?

Q. You said they sent you something about --

A. No, they gave me his name, and I just looked on the internet and saw that.

Q. Now, they sent you a copy of the license agreement, did they not, with Dr. Rossi?

A. I don't recall that. They may have. I, actually I, I doubt very seriously they did.

Q. Were you under a non-disclosure agreement at that time?

A. Probably, but I don't, I don't recall.

Q. Now, did you ever work at 3 Phoenix with a gentleman by the name of Fred Zoful (phonetic)?

A. Fred Zoful?

Q. Yes.

A. No, we never had an employee named Fred Zoful that I'm aware of.

Q. So you never worked with him on any projects that you know of?

A. Not that I'm aware of.

Q. So based on what you've told me, you told them, yes, we can build a testing apparatus of some sort for this technology. You said it would be pretty easy?

A. I would not characterize it as easy.

Q. Okay.

A. But I would say it would be very consistent with other sophisticated systems. I mean heavyweight torpedo is not easy. It's very sophisticated.
Q. Okay.
A. But, yeah, within our capacity.
Q. Did you bid on the job?
A. No. It went, it went all quiet about that time. And then we became very heavily engaged in the sale of our company, and I was focussing on really the sale and the due diligence process with that and ultimately the integration of the company.
Q. You said it went all quiet --
A. Yes.
Q. -- on their side? They didn't ask you for the bid?
A. No. Never heard anything. We never got a formal proposal. We did, we did indicate to them that we had part of a building that would be a very nice site to do that testing, if they wanted to sublet it or take a lease or other things, but no, we never, never heard anything further.
Q. Did you give them pricing?
A. I may have in the meetings kind of gave, given them ROM pricing on kind of this is generally what systems of this sort cost.

Q. Do you recall what that might be? I mean a range?

A. I don't know.

Q. Are we talking millions of dollars? Are we talking hundreds of thousands or 100 bucks?

A. Yeah, I would say middle hundreds of thousands to a million dollars to, to really build out a proper test apparatus. Without knowing the details.

Q. So that was sometime you said in 2012 or 2013?

A. Yeah. Best estimate, yes.

Q. Okay. And then what is the next you heard from them?

A. Well, the due diligence process when you're selling a company to a foreign, publicly traded company, and particular in defense space, is extraordinarily difficult. And I was the principal responsible for that. So most of my attention throughout 2000 -- late 2012 and all the way through 2013 was on the offers that we received to buy our company.

And so I was focussed on the sale of the company, execution of a couple of key programs that I was heavily involved with. And, and so really all the way up until February of 2014, I don't even know that I even talked to Dewey. I, I really never talked to JT or

Tom Darden at that point. They were off doing whatever they were off doing, and so.

Q. But if Dewey or Tom Darden or JT had sent you an e-mail, you would have responded, correct?

A. Maybe. I mean at that time I was, I probably personally evaluated, prepared, and reviewed over 10,000 pages of documentation including documentation requests by the United States Senate for the sale of my company, and so I can't say I would reply to everybody's e-mail at that point. I'm, I try, I would try to reply to people's e-mails, but I can't --

Q. Sitting --

A. -- promise that I would.

Q. Sitting here today, sir, do you have any recollection specifically about them reaching out to you and trying to further obtain your services?

A. Not that I'm aware of.

Q. Okay.

A. No.

Q. Until you said about February 2014?

A. No. February of 2014 we sold the company.

Q. Okay.

A. And then subsequent to that I spent really about, we had some fiduciary responsibilities related to employee stock ownership plans that we had to take care

of. I mean it was our fiduciary, so we had to take care of that. So I spent probably the next six months focussing on the integration with Ultra and getting some of those fiduciaries taken care of.

Q. When is the next time you heard from Industrial Heat?

A. When I had, when I decided to leave 3 Phoenix and just take a little bit of decompression time, I had lunch with Dewey Weaver at the Glenwood Grill, and I would guess it was probably February of 2015, thereabouts. I was at that point preparing to, to leave and letting the Ultra people know that I was going to bug out.

Q. Okay. Sir, I'm going --

(Whereupon, Exhibit 1 was marked for identification.)

Q. I'm going to show you a document which we'll mark as Exhibit 1. Of course, I marked my copy. Have you seen this document before, sir?

A. Yes. This appears to be a contract or employment contract, consulting contract.

Q. Okay. Have you seen it before?

A. Yes, yes.

Q. Okay. And at the end of this document do you see your signature?

A. Yes.
Q. And the signature of JT Vaughn?
A. Yes.
Q. Is it your understanding that as of the 1st day of June 2015 you began doing work for Industrial Heat?
A. No.
Q. Okay.
A. I did not want to go directly back to work. I was trying to take some down time, just decompress. And so really in beginning of May I told JT I would, I would help him get some things organized. He was trying to find a property. He was trying to do things, and so I, I said I'll help you, but I don't want to be paid. So we executed a non-disclosure agreement, and I said, look, I'll just help you from -- I'm not going to come in full time.
And then, you know, by the middle of May they were absorbing more and more of my time. And so in the beginning of June JT said we just have to pay you. I mean it's, we have to pay you. And, and I felt obligated, if they were paying me, that I would have to give my full effort. So beginning in June, that's, that's when it kind of, they started paying me. But I really started working about a month before that.

Q. What type of work were you doing for them during that month in May?

A. Helping them find a property, helping them figure out how to hire people, what kind of employee manual, looking for equipment, starting to kind of get a little bit of a feel for what the other various investments were, so --

Q. Administrative type work?

A. Well, I would say a mix of administrative and technical.

Q. You weren't doing engineering or testing or anything like that at that time?

A. No testing, but engineering, yes. I was doing technical reviews of some of the documents, of some of the information that they would provide me. Like they had shared with me information about a company called CCT, and they had shared information with a, a researcher named Dennis Letts. They had shared with me, they indicated that they were engaged with a company called Lenuco out of University of Illinois, Urbana-Champaign area. So they kind of gave me that information, and I was looking at some of the materials just trying to get familiar with them in technical review.

Q. During that time did they disclose to you anything about their relationship with Dr. Rossi or the Leonardo Corporation?

A. I think that was not the focus. I think that I was aware that they had some type of an agreement and an ongoing activity with him, but the details of that really didn't, it was in June when John Mazzarino and Tom Darden came to me and said we need you to look at this and understand it.

Q. Now, pursuant to this agreement, if you look at Paragraph B, payment, you were to be paid $20,000 per month?

A. Yeah.

Q. So $240,000 a year?

A. Yes.

Q. So a step down from what you were making before?

A. Yeah. Yeah.

Q. Why would you take a one-third pay cut?

A. Because I didn't really care. I was interested in technical work and just doing things I was interested in. So it was not really a, money was not my principal motivator.

Q. Do you know why it is that they hired you as a consultant as opposed to an employee?

A. Yeah. Actually, I, I insisted on that. My

medical benefits renew -- I use a HSA medical plan, and they renew at the beginning of the year. And so when I left Ultra I was in the middle of a, kind of a plan year. And my daughter was sick. She needed some surgery, and I didn't want to mess with the insurance. So I just said, look, let me just consult until the end of the year, and then we'll convert to an employee at the end of the year when the medical plans turn over.

Q. Now, as a consultant were you given a title within the company?

A. Because the intention was for me to transition to a full-time employee, yeah. My title was Vice President of Engineering.

Q. So you were Vice President of Engineering from day one?

A. Kind of from the beginning, yeah.

Q. I'm going to show you a document, sir, that we'll mark as Exhibit 2.

(Whereupon, Exhibit 2 was marked for identification.)

Q. Have you seen this document before, sir?

A. One second. Let me see. Yes, I actually think I prepared this document.

Q. Okay. Now looking, sir, the, the date on the front of this document appears to be January 2016?

A. **Uh-huh.**
Q. Okay. What I'd like you to turn to -- and I'm sorry. This document is a document with a bates number IH00053931. I'll ask you to turn to the sixth page of the document with the bates number IH00053936.
A. **Uh-huh.**
Q. There is an organizational structure there?
A. **Uh-huh.**
Q. And it lists engineering, J Murray. Is that you?
A. **Yes.**
Q. Okay. And it has categories in which I believe you're responsible: Development, integration and tests, data management, project management, modeling and simulation?
A. **Yes.**
Q. Okay. What development did you do for the company?
A. **We developed data acquisition systems and replication reactor systems. We developed calorimetry systems. We developed a wide range of test assets. We developed databases to archive and store all of the information from every test that we did. I don't know. Just broad range of development activities.**
Q. Didn't those exist before?

A. No, not to, not to my knowledge.

Q. Did they have any systems in place when you joined them in May or June of 2015?

A. This, this was for the new facility. So we -- I don't recall when they got the lease on the new facility. I think it was about August or maybe September of 2015. So what we were doing is setting up this entire new organization in the new facility. And so these systems, I -- not that I'm aware of. I don't know what they really had at Triangle Drive. I know they did, they were doing some electrolytic system testing at Triangle Drive at that time. I had gone over there one or two times, but I wasn't really too versed in what they were doing.

Q. Okay. Integration and tests, what was that?

A. So integration and tests is actually taking the development assets, bringing them together and executing test programs using those. So the integration is kind of a validation procedure for the infrastructure that lives over top of, for example, a reactor or we had chambers and other equipment. So we were integrating all that equipment together, and then we were testing it and validating it to make sure that it was operating as we had specified in the development phase.

Q. So that wouldn't be the testing and

evaluation of the underlying LENR technology? And by LENR do you understand what I mean?

A. **Yes, I do.**

Q. Low energy nuclear reaction?

A. **Uh-huh. It would be, in fact, a combination of testing of the equipment and infrastructure necessary to test those reactors as well as the test of those reactors --**

Q. Yeah.

A. **-- when it was appropriate and when we got to that point.**

Q. Data management?

A. **So in my experience, many companies fail to adequately archive and manage data. So what we were doing is we put a very robust plan in place to store and archive the data and metadata associated with tests so we could reproduce it.**

Q. Okay. Project management?

A. **Over --**

Q. Is that anything other than the common term, project management, overseeing all these projects?

A. **It's project management.**

Q. Modeling and simulation?

A. **Right. So we, we attempted to model and simulate as many of the systems as we could so we could**

understand what the anticipated performance was in different scenarios. So we looked at, we used OpenFOAM, that tool that I described, to do 3D simulations of various reactors. We used a series of tools called, it's Python, NumPy, and other associated infrastructure tools to do analysis and modeling of it. So we modeled electromagnetic fields. We modeled the current and voltage supply timing. So general modeling and simulation associated with an engineering system.

Q. Okay. What are the limitations on that, if any? I mean --

A. On modeling and simulation?

Q. Yeah.

A. Oh, there are significant limitations. It really depends on the fidelity and how you describe it, the boundary conditions, but it really depends. We use it as guidance for understanding kind of the range of potential outcomes. So we use it as a tool to guide the development of a test plan and procedure.

Q. Okay. So is there any, within that system what, what is the error rate for the modeling as opposed to the actual testing?

A. I don't know, I don't understand what you mean.

Q. How closely can you predict a result with that system?

A. It really depends on the system. So for example, we modeled one of the reactor system, and we provided specific perimetric information of how much power and what temperatures we measured. And then the simulation was used to, we tuned the simulation to make sure that it was, reflected that. And the results actually were very good. I would say within probably order of two to five percent.

But it also just depends. I mean it depends on the scale, depends on how good the information is. It depends on what your objective is. You might want to do simple models and simulation in certain cases just to kind of guide your thinking --

Q. Which reaction system did you model?

A. We modeled a reactor system called RCT 005.

Q. Okay. Which was the brain child of which inventor?

A. It was a replication of one of the reactor systems that T. Barker and Mr. Rossi had tested previously, earlier on.

Q. Okay. And what was the result of that modeling?

A. Modeling was that the, the, the heat transfer as we had envisioned was actually almost identical to

what we had measured in the calorimetry system.

Q. Okay. So when did you do that modeling?

A. We began doing that about probably October of 2015. And we engaged with a group to consult on how to structure and lay out those models, and then subsequently we ran those models in maybe December and January, which was synchronous with when we were actually doing the testing.

Q. December 2015 --

A. January of 2016.

Q. -- and January of 2016?

A. Yes. And sorry for talking over you.

Q. I apologize. I may have interrupted you there. Okay. What was the purpose of this document?

A. I think January of 2016, I think that either Woodford came to our facility in Cary or we went there. I went there once, and they came to our facility a few times. And I think this was just a, an overview of how we were structuring and moving forward with the various investments.

Q. And so at the time you did the modeling and the, the testing of the reactor built by Mr. Dameron that you said was similar to what Dr. Rossi had tested, still at this time you had had no conversation with Dr. Rossi directly?

A. No, we had not. Incidentally, it was not a reactor that was designed and built by Mr. Dameron. Myself and my engineering team designed and built it, and it was modeled after a reactor that Mr. Rossi and T. Barker Dameron had built previously.

Q. Now, when you say modeled after and, and you've used the term similar, were there differences?

A. Yeah, there were differences. Because what we, what we were trying to do is have a very robust data capture. So what we did was we actually built the reactor with a gas pressure gauge and the ability to capture gases out of the reactor. We built it as a framework to, to build up more and more sophisticated testing to see if we could try to emulate results that had been suggested. And so we added coils. We, it was a, it was an incremental test. We started out very, very simple, and then we added more and more sophistication to see if we could find out what was going on.

Q. Okay. And what information did you use to base or to model after Dr. Rossi's reactor? What information were you provided in order to build your device?

A. So we used a physical geometry and materials that were the same. And then --

Q. Wait, I'm going to stop you for a second.

A. Okay.

Q. You, you said they were the same?

A. Yes.

Q. How --

A. The physical --

Q. -- do you know they were the same?

A. Because T. Barker Dameron had some old reactors that he had brought from Triangle Drive.

Q. Okay.

A. And we looked at them, measured them, and then figured out how to improve them. And then we had ours built and tested, you know, tested for pressure and things of that sort because they had to have welded ends, and so we had to do pressure validation and things of that nature.

Q. Okay. The, you said T. Barker Dameron had a couple old reactors. Did you test any of the old reactors?

A. We did not.

Q. Okay. Do you know if Mr. Dameron did?

A. I believe he did. There was a, at some point on, on Weston Parkway there was a test apparatus set up in the back room which had ceramic reactors. Each one was a single-phase input. I don't know the details of

it because T. Barker kind of was operating independent of the primary engineering team. So he was doing testing. He did, you know, a whole series of testing on those systems.

Q. Did he, other than bring in the old reactors, did he assist you at all in the construction of the reactor you built?

A. He would sit in on the engineering meetings. He would participate, listening in, providing comments, but he was heavily involved with doing an electrolytic test that replicated Dennis Letts's dual red laser electrolytic experiments. So he was primarily spending his time on that and then these other small tests like the one that I just described in the back room.

Q. Do you consider Mr. Dameron to be competent to do those type of tests?

A. I would say that --

Q. I, I promise I will not show him this transcript. I can't speak for counsel over there, but.

A. So I think that, I think that T. Barker is a, is a decent engineer. I would not say -- he would not do things to the standard that I would set for our team. I wouldn't -- I expect complete control over data, complete control over calibrations of information. And so he operated I think in a little more of a freelance

way, in my opinion.

Q. Okay. Mr. Vaughn I believe it was testified that he did not believe Mr. Dameron to be competent to review a test plan and determine whether it was sufficient. Do you have that same feeling?

A. I think that T. Barker's ability to critically evaluate a test plan in the context of the systems that we were building was inadequate. I don't think he had a broad enough set of skills.

Q. Okay. As of January 16, I'm sorry, January 2016 when you prepared this document -- I'd like to ask you to look at the last page, Page 13 of this document -- had you had any successful LENR replications?

A. No.

Q. Okay. So it says, "Professional inventing areas of focus. Works in progress." Am I to understand that's stuff you were working on at the time?

A. This slide was actually produced by Letao Qin. She was our inhouse IP attorney.

Q. Okay. Did you see it before?

A. Yeah, I've seen it.

Q. Okay. Did you disagree with it?

A. I really didn't pay much tension to it.

Q. Okay. Well --

A. There was an ongoing series of invention, kind of invention capture that was ongoing, yes.

Q. Okay. So works in progress, were you working on an LENR steam engine?

A. An LENR steam engine?

Q. Yes, sir.

A. Let me think. Let me think of the time line. The, the folks at Lenuco, which I don't remember when the acquisition occurred, but we were funding them before that, and so we were engaged with them at some point. The folks at Lenuco had come up with a, a concept for a Stirling cycle low-energy nuclear reactor engine. And so we had talked actually in the fall about using excess heat from the, one of these reactors as an application, but at some point along the way we, we described it in a, probably in an invention disclosure, but as we went forward they had actually described it in a lot of detail and produced a invention disclosure on that front.

Q. Was that something that Industrial Heat was working on?

A. This was just part of our activities on capturing IP. So what we would do is we would write invention disclosure. Anywhere anybody had an idea, we would document it, and then we would give those

documents to Letao. And then what we would do is we would sort out is it good enough information, is it, should we pursue more research. So it was I would say a little more nebulous than that.

Q. Was Industrial Heat working on a HVAC system retrofitting?

A. We had a concept for that, yes.

Q. Okay. A concept. Were you working on it?

A. No. We had a concept that we were preparing as part of our invention process.

Q. What about an LENR battery systems?

A. I would imagine that we, that was probably related to Lenuco.

Q. Okay. What about portable heat and power devices?

A. Yes.

Q. Heat distribution within homes and buildings?

A. Yes.

Q. Okay. What I'm having a hard time understanding, sir, is that these are all applications for the LENR --

A. Yes.

Q. -- technology, but why was Industrial Heat working on all these applications if they could not replicate a reaction?

A. So our, our approach to invention was, was to actually take a step beyond the, the application space. And we were investing in, again I don't know if it was five or six groups. And the hope was that one or multiple of those five or six different groups would, would be validated and verified and then reproduced. And after that we weren't really as interested in the, the science. We were interested in application.

So what we asked the engineers to do as we were building up and trying to do validation verification was go a step further and come up with concepts. Where might we want to go if we can get one of these things to work? And so it was kind of a progress, a progression down the pike. And, in fact, this model for professional inventing was derived from one of the people that was kind of on again, off again working with us. And he kind of developed this professional inventing model where you project out one or two generations to capture IP.

Q. Who was that?

A. Paul Morris.

Q. He was working with Dewey Weaver?

A. Actually, no. I think he was working -- well, I don't remember. He worked with Industrial Heat, and then he, he was off for a while, and then he came

back and worked again. So, I, you know, he was on and off, but he developed this model for professional inventing.

Q. Now, on a new technology like this, isn't that putting the cart before the horse?

A. Actually, no. I, I was, I as an engineer, not as steeped in the, kind of the art of the patent office. I would have thought that, but, in fact, the case is that most companies are actually moving out two or three generations out, producing IP and blocking IP. So this model I thought was fascinating to me. So it was one of the tasks that the engineering team, if you're thinking of things, how could we apply this, how might it work, and we would just document it in an IBD.

THE VIDEOGRAPHER: We have three minutes.

Q. Okay. Sir, you said you did testing on Mr. Mizuno's device, and I believe you said there was another. Who was the other? HMRI you did limited testing?

A. We, we did testing on, tests, well, we did validation and verification on all of the investments made to the extent that was possible. Like with Mr. Rossi's technology, we really weren't that able to get too much information just because we were at arms length. Likewise with HMRI, the way the contract was

structured, we were kind of at arms length, so we only got a little bit of information, and the information we were able to receive, we structured some experiments to understand it. That was actually very late. That was probably June of 2016. We also did extensive testing of Lenuco's technology, which was a nickel oxide technology, a powder, nanoparticles.

So we had Mizuno, HMRI, Lenuco. We had a company called CCT, Cooper Core Technology, out of Albuquerque, New Mexico. CCT was doing nickel foam in heavy isotope environments. We evaluated theirs. In fact, what we found was that their technology was so immature and it was so, I don't know, it was so speculative that we didn't even make any investment. We actually terminated in the due diligence process.

We also worked with, excuse me, Dennis Letts. Later on there was a little bit of funding for Dennis Cravens. That was kind of very late, and it was just kind of seed funding. Let me think. There, there might be others.

Q. Okay.

A. So.

Q. Now, I want to, I want to draw a distinction between trying to validate and verify other people's test data versus attempting to replicate --

A. **Right.**

Q. -- the data. How many replication tests did you perform at Industrial Heat?

A. **We replicated, let's see. We replicated Mr. Rossi's. We replicated HMRI. We replicated Mizuno. We replicated Dennis Letts. We replicated -- did I say Lenuco?**

Q. No.

A. **Lenuco. We didn't do anything with Claytor and Fowler. They were more of just kind of providing testing services. I think about that group.**

Q. Okay. So back in 2012, 2013 when you first had contact with Mr. Darden and Mr. Vaughn, you had said, hey, we can set up this testing system for you to evaluate these devices. Did you ever build that testing system?

A. **I need to be a little careful. The answer is no, we did not build that testing system, but at that time we were only talking about the one technology of Mr. Rossi's.**

Q. Okay.

A. **That's all.**

Q. But you never built that system?

A. **No.**

Q. How many tests did you run on the device that you built that was similar to Dr. Rossi's?

A. We ran that, so it was, it was almost a continuous test for a period starting in December of 2015, and I think we ultimately shut it down in maybe late February or March, and within that RCT 005 archival of the databases we probably had six or seven distinct tests where we had incrementally improved or changed.

Q. I'm sorry. How many?

A. Six or seven. I'm guessing. I would have to look back at the data, but approximately.

Q. Now, you said you never tested one of Dr. Rossi's old devices, correct?

A. We, the engineering team did not. T., as I described, T. Barker had set up one in the back room and tested that. I think that was at the request of Tom Darden and John Mazzarino.

Q. Okay. But you don't believe that he had the, the ability to properly run a test, correct?

A. I don't.

Q. Okay.

A. No.

THE VIDEOGRAPHER: Counsel.

MR. ANNESSER: Okay. We have to take a short break.

THE VIDEOGRAPHER: We're off record at 10:57

a.m.

(Recess taken 10:57 a.m. to 11:05 a.m.)

THE VIDEOGRAPHER: We are back on the record at 11:05 a.m.

(Whereupon, Exhibit 3 was marked for identification.)

BY MR. ANNESSER:

Q. Sir, I'm going to hand you a document, which I have marked as Exhibit 3. It's an e-mail from Tom Darden to yourself dated December 1, 2015, bearing bates number IH 00087704.

A. Uh-huh.

Q. Have you seen this e-mail before, sir?

A. Yeah, it looks vaguely familiar.

Q. Okay. In an e-mail that you wrote to Mr. Darden on December 1st you state, "We should have at least TBD Legacy Ross -- Rossi system in calibration and our system alive."

A. Uh-huh.

Q. That TBD Legacy Rossi system, what did you mean by that?

A. T. Barker Dameron Legacy Rossi system.

Q. Okay. Why --

A. That was the system in the back of the building.

Q. Why did you call it the T. Barker Dameron Legacy Rossi system?

A. Because it was the system that he had developed I guess with Mr. Rossi at Triangle Drive. At this time we were trying to get everything out of Triangle Drive and into the new building, and so I think we set a deadline for T. Barker to get all of his stuff out of the old building and into the new building on December 1st. And so they wanted to know are we out of the Triangle Drive building. And so he was coming over and he was setting up, as I described, this 3-reactor system in the back room, and he was setting up his dual red laser system in the main area.

Q. Okay. So as of December 1, 2015, you had not tested any Rossi system, correct?

A. No. We were at the same time buzzing out our system --

Q. Okay.

A. -- in the controller. So we had started in October to build up the, the replication systems, but we really didn't get in the facility until November. I mean we were kind of in it while it was under construction, but we finally had our lab space. And so we started to build up those systems. And when I said buzzing out lines, what we were doing was we were

testing all of the instrumentation and testing the temperature controller and testing the ramping functions, all the things, but it wasn't a fuelled reactor.

So we began a fuelled reactor, my recollection was just a little bit before Christmas. Maybe 16th, 17th of December, and we ran it all the way from that point going forward.

Q. Okay. So taking just a quick step back. You never tested the T. Barker Dameron system. You were testing your own system?

A. Right. We were testing ours.

Q. Okay.

A. And T. Barker was testing his in the back room.

Q. Okay. And you don't really know what he was doing other than --

A. He was --

Q. -- just --

A. Yeah, I remember he had a thermal imager, and he kind of described it to us a little bit. I recall asking him to set up a test plan and test procedure and, so we could document what was going on, and that just fell by the wayside.

Q. Did you set up a test plan and test procedure for your test?

A. **Yes, we did.**

Q. Do you know if that was produced in discovery?

A. **I'm pretty sure it was. We took the entire body of all the data and shared it. So I would imagine it's somewhere in there, test plans and test procedures.**

Q. Okay. And where is the device that you tested now, if you know?

A. **I can't say today, but I know before we closed up shop we took everything related to the litigation under the direction of Jones Day and we put it all together, and we boxed it up and we put it into the locked facility in the back of the building. So I'm sure it's all in there.**

Q. Okay. So you left it personally with --

A. **Industrial Heat.**

Q. -- Industrial Heat? All right.

A. **Yes. I'm sorry.**

Q. Now, after that system was not successful in your replication attempts, did you think it would be prudent to test one of the devices that Dr. Rossi had built to see if you could get it to work?

A. **We did not. Most of those devices were damaged. And in our, in my opinion and, in fact, the**

engineering team's opinion, they were poorly constructed and poorly designed, and so it would have been difficult to do an adequate job with the instrumentation. Furthermore, a lot of the testing techniques that they were using were actually dangerous, and so we were trying to be very careful not to have anybody be, get hurt.

Q. Okay. So the, the device that you created or your team created was built without, well, what you I guess define as defects or poor construction? It was built more solid and safer in your opinion?

A. I would describe it as we built a very, carefully constructed and designed the system relative to the requirements, the parameters, the pressures and temperatures that we thought it would experience. And so we did that to, yeah, to protect anybody that was working around it.

Q. In doing so, before you built this system did you study the report from Dr. Penon from the validation test?

A. Which report was that?

Q. The report from 2013 testing.

A. I am confident that we had, we had looked at that, but we felt that using infrared thermal imaging was inadequate, and so we took a different strategy as

far as how to actually measure the system and how to collect the data.

Q. And how did you measure the system?

A. We took an array of thermocouples that we placed on the reactors. We had both an active and a, an active reactor with fuel from Tom Darden, and we had a, a reactor that had only the nickel powder, so an inactive reactor. We made them completely identical. We put a pressure transducer on it. We included a vent-off system so we could dump off any overpressure to the hood, to dump the gas outside. You don't want the gases lingering around the lab.

We put an array of thermocouples down the reactor. We insulted the reactor, and then we put an array of thermocouples inside the chamber. And then we took the chamber, and we operated it on a continuous rate. And we measured the power, the voltage, and the current at every point in the system and, and operated it that way. That was the baseline system. And then gradually over time we added more and more capability based upon what we, what we inferred was happening with, with Mr. Rossi's system.

Q. That's fairly substantial differences from Dr. Rossi's basic device, is it not?

A. How is that?

Q. Well, you, you just talked about adding a number of thermocouples, a vent, and a number of other things.

A. Yeah, I wouldn't describe it -- the actual physical structure was same physical geometry, same materials, same size. What we basically did was put a stainless steel tube on the end with a, with a, a valve and a pressure transducer, and we put a series of thermocouples on it to measure the temperature throughout as an array, and then we measured the environment and the power going into it. I would say that from an engineering perspective, I would say that's a baseline, minimum acceptable test.

Q. Okay. Now, you said Mr. Darden prepared the fuel?

A. Yes.

Q. Did you watch him prepare it?

A. No.

Q. Do you know if he followed the formula?

A. I have no idea.

Q. Okay. Do you know when he prepared the fuel?

A. We had those, so we went through and validated the operation of the empty reactors. And then about, around Christmas, a little before Christmas Tom came into the lab, I think it was on a Saturday, and he

brought fuel from some other site. And he asked I think myself and one other person were there, he asked us to actually leave the lab area and go up into the office area. And then he went back under the chemical hood and fuelled up the one reactor and then put just the nickel powder in the other reactor, closed them all up, sealed them, and then we put them into the, into the test chamber.

Q. So you don't know sitting here today whether he properly fuelled the reactor or not?

A. Absolutely not. No, I have no idea what was even in the fuel.

Q. Okay.

A. Other -- I shouldn't say I have no idea. I have read the patent, and the patent describes the basic constituent materials, so, but other than that, Tom was the sole keeper of the trade secret, as he described it.

Q. Okay. So, but I just want to make sure. Sitting here today you don't know whether it was properly mixed or not?

A. Absolutely not. Absolutely not.

Q. He could have put a handful of gravel from outside --

A. Absolutely.

Q. -- for all you know?

A. Yeah. I mean gravel would have been hard to fit through the hole, but, but he could have put anything in there --

Q. Sand.

A. -- yes. Absolutely, yes.

Q. Do you have any ownership interest in Industrial Heat?

A. I have stock options. When I came on as an employee, they gave me stock options, yes.

Q. Do you have any stock?

A. So part of the severance agreement, which I really didn't pay much attention to, was that some of the stock vested the first year increment, vested. The rest of it was forfeited at severance. And then at some point, like probably within the last month, it converted from one type to another type, but to be honest I didn't really pay much attention to it.

Q. So you own, you own stock in the company?

A. I own some kind of stock in the company, yes.

Q. Okay. Now, is it your understanding that Industrial Heat received monthly e-mails with the operational spreadsheets from the Doral facility that was testing the, Dr. Rossi's E-Cat plant?

A. I know that there were some reports that were coming in. I don't know what the exact increment. From

time to time I would get a copy of an updated report, could have been a monthly. It could have been a weekly. I really don't know, but I did get copies of those from time to time. In addition, I got copies of an invoice request as well.

Q. And were you asked to do anything with those?

A. We cataloged them and just kind of tried to make sure that we understood what was happening in the spreadsheets to make sure the calculations were consistent based on the numbers that were provided.

Q. And did you ever notice inconsistencies?

A. Yes.

Q. Okay. Did you bring that to anyone's attention?

A. Yes.

Q. Whose?

A. Tom Darden, JT. All the way back in June of 2015 I had highlighted a number of inconsistencies. And as things came in, units changed. It was, they changed from kilowatts to watts. They changed from, I don't know, pascals to bar. And so different things were changing, so we had to be a little careful. And I did highlight that and told people, hey, we have to be careful with this, make sure we track this carefully.

Q. So you had mentioned earlier that you met with Barry West?

A. **Yes.**

Q. Did you ever speak to him on the phone when he was down in the Doral facility plant?

A. **Yes.**

Q. How often?

A. **Two or three times. Well, I should say either by phone or text message, so some combination of those. Maybe two or three times.**

Q. Okay. And what was the subject matter of that, those conversations?

A. **I was trying to get, because there were no red-line drawings of the system configuration that were made available to me, I was trying to understand what is the configuration. Because in the Penon report, you know, as I pointed out earlier, there was a discrepancy of an order of magnitude in the flow rate between the body of the text and the, and the spreadsheet. And so I wanted to understand, you know, I mean is this just simply a typo or is this, you know, which one is right?**

Q. Okay.

A. **So I, I was trying to get information on what is the power meter, how is it used --**

Q. Okay.

A. **-- for the incoming power and, second, where**

are these flow meters. Is there a steam flow meter? Is there, you know, just give me information about what you can see and what you know.

Q. What did he tell you?

A. He gave me -- so I met with him in person as I described in about the August time frame down actually at the beach. We had lunch, and he described kind of everything he knew. And he sent me a couple of pictures of the, the power meter, and he said he just didn't know much. He was kind of, you know, an electrician and just collecting, you know, just there to help as much as he could.

Q. Well, I can understand the, the concern over the amount of flow rate, you know, being zero left off either by accident or on purpose, and you needed to understand that. Did you ever ask him to go look at the flow meter and say, hey, this is what it is today?

A. Yeah, we did.

Q. Okay.

A. He was unaware that it existed.

Q. He was unaware that it existed?

A. Yes.

Q. Okay. Did you tell him to go look at it?

A. I didn't know it existed either. So I had never been to the plant. I was looking for what is this

flow meter, what is the model. I didn't have that information until actually February 16th or 17th when we were all at the plant. That was the day. I was like, oh, there it is. So that was the condensate return flow meter.

Q. So how else would they have measured flow?

A. I have no idea.

Q. Okay. So that wasn't a concern to you?

A. Oh, it was absolutely a concern.

Q. Did you tell him, hey, look --

A. It was concerning --

Q. -- look for the pipes?

A. Yeah. Yeah. Yeah, he was, he was very hesitant to do anything. He, he would only kind of do things where he felt comfortable. He didn't want to go looking around because he felt like he was being watched. And he didn't feel comfortable doing much. I, I asked him, I said, well, you know, where is the flow meter? Where is, is there a flow meter on the steam side? You know, where is this stuff? There has to be this information if, if it's a functioning plant. And he wasn't capable of answering.

Q. So he never once, once went and read the, the flow meter for you?

A. No, not that I'm aware.

Q. Did you ever talk to Fulvio Fabiani?

A. Yes, I did.

Q. Okay. Did you ask him about the flow meter?

A. I don't believe I asked Fulvio anything about the flow meter until 2016 when we were in the plant and then subsequently when he met with us at Jones Day. He came over and provided a bunch of data and information and described lots of things to us at that meeting. And I think that was a point when I asked him about the flow meter and things like that.

Q. So you never asked about the flow meter to Mr. Fabiani before 2016?

A. The first time I communicated with Mr. Fabiani I believe was in 2016.

Q. Why didn't you call him beforehand? Certainly somebody at Industrial Heat had his number.

A. Yeah. I think JT Vaughn was in contact with him, but I had never met him.

Q. Do you know if JT Vaughn ever asked for a reading of the flow meter?

A. I don't.

Q. Do you know if, well, did you ever ask JT Vaughn to get that information for you?

A. Yes, I asked everybody. I said we need information from the flow meter, and we need to know

what the model of the flow meter is. We need to know the type. We need to know what flow meter is on the condensate line, what flow meter is on the steam side. We needed all that information.

Q. Did you, did you look at the, the test plan?

A. I did, yes.

Q. Okay. And that didn't indicate anything to you?

A. At some point along the way after the fact once, once I actually got my eyes on what they were doing down in the plant in February of 2015 when we were there on that, those two days and I saw what they were doing, I went back and scoured through all the documents. And there was a document where they had a bullet line of what the flow meter was --

Q. Okay.

A. -- on the condensate line, but I had not seen that before that.

Q. So they had that though?

A. There was a --

Q. That was information that Industrial Heat had?

A. There was a document that had that, yes.

Q. Okay. And you hadn't seen that before?

A. I had not noticed it, no.

Q. Okay. But Industrial Heat had it. It wasn't a secret. It wasn't --

A. That's right.

Q. Okay. Now, you're dealings with Mr. Fabiani, did he ever tell you that he felt like he was between a rock and a hard spot, you know, sitting there between Industrial Heat and Dr. Rossi?

A. Yes. Yes.

Q. Okay. Do you have any reason to believe that that wasn't the case?

A. No. He described his relationship with Mr. Rossi when he was at Jones Day with us. He described his relationship as he, he was very close to Mr. Rossi's wife. I don't recall her name. He, he described it as she was kind of like a sister or a mother to me, and that he felt like he was really in a hard spot because he couldn't do anything without being under the scrutiny of Mr. Rossi.

Q. Did he ever tell you that Dr. Rossi was very disappointed in him because he thinks that he is an IH spy?

A. I don't recall those exact words, no.

Q. Okay. I'll show you a document that we'll mark as Exhibit 4. It bears the bates number IH00087145.

(Whereupon, Exhibit 4 was marked for identification.)

MR. LOMAX: Thank you.

Q. Do you recall receiving this e-mail, sir, which was sent by Mr. Fabiani to yourself on April 25, 2016?

A. Yes.

Q. And do you recall him telling you that he is, I think the words he used is between the hammer and anvil?

A. I don't recall the specific e-mail, but yeah, I mean this, this looks like almost the same as what he described when we met before this at Jones Day.

Q. And isn't it true, sir, that Industrial Heat refused to pay him for his last invoice?

MR. LOMAX: Objection to the form of the question.

A. Okay. Mr. Fabiani committed to delivering to us a final report that he was preparing. And so when we met with him in, at Jones Day prior to this, he said the next day he would produce two things; all of the data that he had collected, and he would produce a final report with all of the details of what he had done during the one-year period. And, and we said as soon as you do that, we'll release your final payment and we'll

go from there. And the next day he said he would not release that information, and then we began a dialogue of continually not getting the information.

Q. That, that information, I'm sorry, that final payment was already past due, was it not?

A. I have no idea.

Q. Okay. Now, Mr. Fabiani sent reports on a regular basis to Industrial Heat, did he not?

MR. LOMAX: Objection to the form of the question.

A. I am not --

MR. ANNESSER: What's the objection?

MR. LOMAX: It's leading.

MR. ANNESSER: He's an opposing party witness, Chris.

MR. LOMAX: It's just my objection for the record.

MR. ANNESSER: Okay. Thank you.

BY MR. ANNESSER:

Q. Go ahead, sir.

A. Can you repeat the question?

Q. Yes. Isn't it true that Mr. Fabiani sent regular updates and reports to Industrial Heat?

A. I'm not sure. Those in my, in my best judgment would probably have gone to JT Vaughn.

Q. Okay. Were they ever shown to you?

A. Not that I recall.

Q. Would those have been helpful to you in your replication efforts?

A. I don't know what the content of the, the --

Q. If --

A. -- reports were.

Q. If he sent reports regarding the amount of power used or water flow, or anything for that matter?

A. No, I don't believe those would be valuable relative to the replication efforts.

Q. But --

A. It would have been useful information relative to understanding what was happening in that facility.

Q. Did you ever ask JT Vaughn for anything that they received?

A. I don't recall.

Q. Power usage reports from Mr. Fabiani?

A. Actually, yeah, I recall at some point, probably after the test was complete, getting a PDF file with a spreadsheet. I mean I have a vague recollection of this, but subsequent to that, when we met at Jones Day Mr. Fabiani provided us with a series of spreadsheets and data that we actually analyzed.

Q. Okay. Have those spreadsheets and data been provided do you know in discovery?

A. Yes, I believe they have. I should say we have provided them to Jones Day. What they provide I, I don't know.

Q. Okay. So when Mr. Fabiani met with you, was it with Jones Day or without Jones Day?

A. With Jones Day.

Q. Okay. What was discussed at that meeting?

A. He had, he had indicated that he had a lot of data and that he would share that data with us. So initially we were just having small talk, you know. He kind of -- introduction. We had never really formally met in a, a less kind of stressful environment. So we chatted. He kind of gave me a little bit of his background. I gave him a little bit of my background. He was familiar with some of my defense background, and I was familiar with some of the work that he had done in Israel.

So we had small talk, and then we had a discussion about what he had done and the data that he would provide us, and he gave us a little bit of information. He gave us some, several spreadsheets, and then subsequently he made a commitment to give us additional data that we, actually I don't know if we've

received it now, but at that point we had not received it.

Q. So you haven't analyzed that now?

A. I'm sorry?

Q. You haven't analyzed the additional data that he's given you?

A. I don't know if we've received it.

Q. So you don't recall ever seeing monthly, monthly spreadsheets?

A. No. I, I received monthly spreadsheets from Mr. Fabiani when we met at Jones Day, and we analyzed that data. And at some point probably in the first, you know, first part of 2016, maybe after the test, somewhere thereabouts there were some spreadsheets that were in PDF form that were shared with us.

Q. And that meeting was in 2016 after the test was --

A. Completed, yeah. I think it was in March. I would have to look back to see when I flew down to Miami.

Q. So you never received monthly spreadsheets --

A. Before.

Q. -- before that from anyone?

A. Not that I'm aware of.

Q. Did you receive --

A. Oh, there were the monthly or -- the reports that Mr. Penon had submitted, I don't know if they were monthly or quarterly. And from time to time I would get those updates, and we would look at those. That's the ones that I was describing as units were changing and there were some, you know, things that we had to be careful with.

Q. So I know I asked you this before, but I need you to refresh my recollection. When is the first time that you saw the test plan for the test being performed by Mr. Penon?

A. Probably, you know, it's hard to know which one. I saw a commissioning report. That's what I reviewed along with the, all of the information that was available at that point in June of 2015. The test plan, kind of the precursor to that, I think it was kind of incorporated in it, but it wasn't exactly the same. These things, the reports kind of changed over time.

Q. Okay.

A. So I don't really know exactly when I saw the test plan, but I know that after we went on the 15th and 16th and I saw the flow meter, I went back and scoured through all the documents I could find, and then I found a document that had a reference to a flow meter in it.

Q. Okay. And what was that document, if you

recall?
A. **I, I think it was a, a early test plan. I, I don't know if that's actually -- it wasn't, I don't believe it was included in the commissioning report, which kind of went through April time frame is my recollection.**
Q. Okay. Who is Jed Rothwell?
A. **I'm sorry?**
Q. Jed Rothwell?
A. **Jed Rothwell is a guy that follows low-energy nuclear reaction technology. I think he's based in Atlanta.**
Q. Do you know if he's ever been paid by Industrial Heat for any services?
A. **I do not know.**
Q. Have you ever worked with him?
A. **I've met him once.**
Q. And --
A. **I've never worked with him.**
Q. When did you meet him?
A. **He was coming through the area. He was traveling from somewhere up north back to Atlanta. I want to say about June or July of 2016, thereabouts.**
Q. What, did he come to the facility?
A. **Yes, he did.**

Q. Did you show him anything you were working on?

A. I don't think I did. I think that he was with either Dewey Weaver or JT Vaughn, my recollection. And I think they gave him a, a very limited tour of some of the things that we were doing.

Q. Now, sir, you said earlier in this deposition that there came a time that JT Vaughn reached out to Dr. Rossi and said he would like to bring you down?

A. Yes.

Q. Had you ever talked to Dr. Rossi before that?

A. No, I haven't.

Q. You've never been introduced to him?

A. Not as far as I, I personally had never met him or been introduced to him until February of 2016.

Q. Okay. So to your knowledge he, he wouldn't have known you from --

A. Adam.

Q. -- Adam?

A. No.

Q. Okay.

A. Excuse me.

Q. Was there a reason why you or Mr. Vaughn wanted to get Dr. Rossi worked up by proposing that you come down?

A. **Not that I'm aware of.**
Q. I'm going to show you a document, sir, that I will mark as Exhibit 5 to this deposition. It bears the bates number IH00088952.
(Whereupon, Exhibit 5 was marked for identification.)
MR. LOMAX: Thank you.
Q. There's two e-mails on this first page.
A. **Uh-huh.**
Q. The first one is from JT Vaughn to Dr. Rossi in which he says, "Also, I would like to introduce you to one of our new team members, Joe Murray. He and I have booked a flight down on Tuesday afternoon and will depart Wednesday afternoon. I hope we can come see you at the plant on Tuesday afternoon." And then it continues.
A. **Uh-huh.**
Q. Is that the e-mail to your understanding that Mr. Vaughn sent Dr. Rossi to alert him of your trip?
A. **Yes.**
Q. Do you know if there's any other introduction made at that time prior to that?
A. **I have no idea.**
Q. Okay. Is there a reason why he wouldn't have referred to you as the new Vice President of

Engineering?

MR. LOMAX: Objection to the form of the question.

Q. Okay.

A. I have no idea.

Q. And then there's an e-mail above that from JT Vaughn to you. And it states, "All right. He'll start getting worked up now. Should be a fun trip."

A. Uh-huh.

Q. What did you take that to mean?

A. That Mr. Rossi did not want us to actually have access and see what was happening in the plant.

Q. Now, why did you take it to mean that?

A. Because the data didn't support what was happening in the plant, and we had a lot of questions, and I wanted to understand it. And so as part of the task that John Mazzarino and Tom Darden gave me, they said evaluate it, figure it out. And, and consistent with their, their drive that even if there's a one percent or a half a percent chance that he's right, they said we have to find out.

Q. Has, to your knowledge has Dr. Rossi ever refused anyone else to go to the plant?

A. I am not aware.

Q. Do you know if T. Barker Dameron has ever been down there?

A. I think he had when they were setting up the plant, yes.

Q. Did you ask him about his trip down there or how things were set up?

A. Yes.

Q. And you still didn't know the configuration?

A. No.

Q. Did he ever try to come back down --

A. I am not --

Q. -- to your knowledge?

A. -- aware. I am not aware.

Q. So why would Dr. Rossi -- or why would he say he'll start getting worked up now?

MR. LOMAX: Object --

Q. You said you, you said you took that to mean that he didn't want you coming down?

A. Yes.

Q. Well, so you knew that before --

A. No, no, no. He sent --

Q. -- he even asked?

A. I believe he sent this e-mail --

Q. Two minutes after the original e-mail.

A. -- after, he sent that e-mail to me saying, well, he's going to start getting worked up now.

Q. He sent, no, he sent an e-mail --
A. Yeah.
Q. -- to Dr. Rossi, July 13, 2015, at 9:10 a.m.?
A. Yes.
Q. Two minutes later at 9:12 a.m. on July 13, 2015, he sent you an e-mail saying, "All right. He'll start getting worked up now. Should be a fun trip."
A. Uh-huh.
Q. Did, did he tell you beforehand that he would get worked up and oppose you coming?
A. I think everybody thought that me, being an engineer, coming down to inspect the plant was going to cause Mr. Rossi some concern.
Q. T. Barker Dameron is an engineer, isn't he?
A. He is.
Q. He was never refused access, was he?
A. I am not aware.
Q. T. Barker Dameron worked with Dr. Rossi for some time?
A. Uh-huh.
Q. Are you aware of any problems with that?
A. No, I'm not aware.
Q. Okay. Any reason to believe that Dr. Rossi knew anything about you, Joe Murray?
A. I don't know. I, I believe that at some

point Tom Darden indicated that he was hiring an engineering team and that they were bringing, ramping up Industrial Heat. I don't know if they shared that information with Mr. Rossi though.

Q. Okay. Well, it certainly appears that JT Vaughn knew that Dr. Rossi would get upset by that suggestion.

A. Of bringing somebody new in the plant?

Q. Yeah.

A. It appears that way, yes.

Q. And Dr. Rossi didn't know you from Adam at that point in time. And specifically at that point in time isn't it true that you weren't even an employee of Industrial Heat?

A. No. I was --

Q. You were a consultant?

A. -- working as a consultant, that's correct.

Q. Okay. So at that point in time you knew as of two minutes after they sent that e-mail, before Dr. Rossi ever responded, that it was going to be a problematic situation?

A. According to what JT sent me, yes.

Q. That was the intent of this original e-mail, wasn't it?

MR. LOMAX: Objection to the --

Q. To create a problem?

MR. LOMAX: Objection to --

A. Absolutely not.

MR. LOMAX: Excuse me. Objection to the form of the question.

MR. ANNESSER: What's the objection?

MR. LOMAX: You asked him was the intent of the e-mail to --

MR. ANNESSER: If he knows.

Q. Go ahead, sir.

A. Absolutely not. The intent was for me to go down to the plant, inspect the plant, figure out what was going on, and then try to understand the, the content of the reports.

Q. Now, it says, "I have booked a flight down Tuesday afternoon."

A. Uh-huh.

Q. So you booked the flight. You, you guys booked your flight before even telling Dr. Rossi, hey, we'd like to bring Joe Murray down?

A. Yeah. I think, I think that the, the Industrial Heat people booked the flight, yes.

Q. Okay. To your knowledge, did anyone call and say, hey, Andrea, we got this new guy, he's great, Joe Murray, he's on board, he's our VP of Engineering, we'd like to bring him down, prior to this e-mail?

A. **I have no idea.**

Q. Okay. How did Dr. Rossi respond to this e-mail, Mr. Vaughn's original e-mail?

A. **The trip was canceled. I was not going to be allowed into the facility.**

Q. How did Dr. Rossi respond?

A. **I, I don't recall.**

Q. Do you know if it was canceled because of Dr. Rossi?

A. **It was canceled because I was not going to be allowed into the facility.**

Q. By who?

A. **By Mr. Rossi.**

Q. Did you ever speak with Mr. Rossi about that?

A. **I did not.**

Q. Did you ever reach out to him at any point before or after that and say -- you know, by, by mid July when that e-mail was sent, you had been working May, June, so two and a half months with Industrial Heat?

A. **Uh-huh.**

Q. As the head of engineering? Or, I'm sorry, the Vice President of Engineering?

A. **Uh-huh.**

Q. And you never reached out to Dr. Rossi and said, hey, nice to meet you, I'm really interested in your work, we should talk?

A. No.

Q. Is there a reason?

A. There was no contact. I wasn't provided information. I, I think at some point I said, hey, should I send an e-mail, but.

Q. And what did they say?

A. As far as I know, I never did send an e-mail.

Q. Who did you ask that to?

A. I think John Mazzarino, Tom Darden, and JT Vaughn. I think. Is my recollection.

Q. Are you aware that Mr. T. Barker Dameron had been instructed not to confer with Dr. Rossi?

A. No, I was unaware of that.

Q. Were you ever given that instruction?

A. Not that I'm aware of.

Q. Okay. So you were never told not to contact Dr. Rossi?

A. Uh-huh.

Q. You just elected never to talk with him?

A. No. We were working on multiple different initias at the same time. And so I was instructed to analyze all the data we have; if we have the

opportunity, go down, look at the plant, try to figure out what's going on, and move forward. The instruction was if there is even one percent or a half a percent chance that this works, we want to know so we can move forward.

Q. Well, I absolutely understand you want to do your, your investigation. So after Dr. Rossi originally said no to you coming to the plant, did you follow up at all? Did you say, hey, why don't I, you know, why don't I give him a call?

A. No.

Q. You don't --

A. I was never introduced to him.

Q. Okay. Is there a reason? I mean --

A. Not that I'm aware of.

Q. Do you know of any reason why this Dr. Rossi that you've never met would dislike you so much to say, no, you can't come?

A. Not that I'm aware of.

Q. That didn't bother you at all?

A. We had numerous things moving at the same time, lots of different activities. So it was just one of the things.

Q. Do you know of any attempts whatsoever after that to have you come down?

A. Not that I'm aware of, not until 2016.
Q. Now, after that you said -- how long after that e-mail was sent did you meet with Mr. West?
A. I think in August is my recollection.
Q. So a month or so after?
A. Yeah. Two to four weeks later, yes.
Q. Okay. Was, was that meeting because an attorney told you --
A. No.
Q. -- to have that meeting by any means?
A. I was trying to, you know, as part of the effort of all of these different activities and hiring people and getting the facility organized, I was trying to get a handle on all the different projects. And, and it was suggested, hey, Barry's down there working, talk to Barry and get, get whatever information you can from Barry. And so T. Barker and I -- Barry was back on one of his leave. And T. Barker and I went and had lunch with him down at the beach.
Q. So that wasn't, that meeting wasn't in preparation for litigation, was it?
A. Not that I'm aware of.
Q. I'm going to show you, sir, a document which we'll mark as Exhibit 6.
(Whereupon, Exhibit 6 was marked for

identification.)

MR. LOMAX: Thanks.

Q. Have you seen this document before, sir?

A. Yes. I wrote it.

Q. Okay. Sir, this says, "Subject, summary of the Swansboro meeting."

A. That's --

Q. Where is Swansboro?

A. That's at the beach.

Q. Beach where? What state?

A. North Carolina.

Q. North Carolina. Okay. The date on it is July 18, 2015.

A. Okay.

Q. It's not, so that --

A. That was only a few days later.

Q. So just a couple days --

A. So July. Yeah, July, not August.

Q. All right. So just a couple days after this initial refusal you set up this meeting?

A. Yes.

Q. Okay. And the first thing you put in bold letters is, "This document is protected by attorney-client privilege."

A. Yes.

Q. Why?
A. Because I was told to write it was protected by attorney-client privilege.
Q. By who?
A. By Tom Darden and John Mazzarino.
Q. Do you know why?
A. I don't.
Q. It's because they were trying to set up litigation, isn't it?
A. I have no idea.
Q. Okay. Do you know if they were anticipating litigation at that point in time?
A. I think that they probably were expecting that there was going to be a problem.
Q. Why?
A. Because Mr. Rossi wouldn't allow me in the plant to see what was going on.
Q. Okay. So if I understand correctly, and tell me if I'm missing something here, but you asked to come down on July 13th?
A. Uh-huh.
Q. And by July 18th they, and there's one communication; hey, we're going to come down. Dr. Rossi says, no, I'm not letting Mr. Murray in, but the rest of you can come. And then after that, within five days

they're anticipating litigation with no further attempts to say, hey, no, trust me, Joe's really a good guy?

A. Yeah, I have no idea what their intention was. I just wrote a report on what I had found and marked it as they told me to mark it.

Q. You can see though how it appears to me that this was a setup, this was a setup for litigation? They, they knew two minutes after sending the e-mail that they were going to create a problem, and then within a week they have you write a report that says, "This document is protected by attorney-client privilege." Do you see that?

MR. LOMAX: Objection to the form of the question.

A. It would be speculation on my part to know what John Mazzarino and Tom Darden were thinking and JT Vaughn, but.

Q. So you never asked why they wanted attorney-client privilege on there?

A. I think that they were concerned that the refusal to let me in was problematic.

Q. So that wasn't your idea though?

A. No.

Q. Okay. What was the purpose of this memorandum?

A. To --
Q. Did they ask you to prepare this?
A. Yeah. I, this was a summary report of everything I had gathered and everything we talked about with Barry when T. Barker and I had lunch with him. So I just wrote it all up so I can move on to the next project and kind of put this in the folder and move on.
Q. Okay. So as of this time, July 18, 2015, you were still a consultant --
A. Yes.
Q. -- correct? And it says in the second paragraph of this document, "The data reviewed in support of the proposed July 14th introduction and plant tour included background contract documents" --
A. Uh-huh.
Q. -- "requests for invoice from Henry W. Johnson, President of JM Products, and reports from LI's consultant and advisor, Dr. Fabio Penon." --
A. That's correct.
Q. -- correct? So you had seen the contract at least by that point?
A. I think I saw either a term sheet or documents that I thought were the contract, yes.
Q. Do you know why those were shown to you?
A. Yes. So I could understand the requirements

associated with the plant, and we could figure out what was going on.

Q. What do you mean the requirements associated with the plant?

A. So what was the operating time, how much power was it supposed to be producing, what was the relationship with Johnson Matthey Products, Incorporated, etcetera.

Q. Okay. Did you look at the requirements pursuant to the testing required in the license agreement?

A. I don't recall. I don't recall which part, which document. I may have broadly described the contract as the licensee agreement or the, the contract. In fact, they may be the same thing as far as I'm concerned.

Q. Now, this appears to contain your take of reports from, or from information you received from Barry West?

A. Yes.

Q. Okay. Number 3 says, "It was indicated that there was a steam flow sensor installed in the system by Dr. Penon. This sensor was located in the steam line between the source and the sink, but the device burned out at some point and, therefore, no data on mass or volume flow is readily available."

A. **Yes.**

Q. Do you see that?

A. **Uh-huh.**

Q. Do you know that to be true or?

A. **I don't. I only know what Barry said.**

Q. Okay. Now, he seems to provide you quite a bit of information for a guy that didn't even know where the flow meter was.

A. **Yeah.**

Q. He's a very observant guy?

A. **Yeah, I don't know if I would agree with that. I think that he was around the plant a lot and he collected, you know, he looked at and worked on the systems quite a bit. So I think at this point he was probably there for more than six months, kind of in that plant for eight hours a day.**

Q. And at this time did you discuss with him the equipment being used to monitor?

A. **Yes. Specifically, the PCE-830. And as much information as he could give us about flow rates. That was a principal concern, is how are they measuring, how are they closing the thermodynamic system. And so if we can understand that, we can understand, hey, do we have a, do we have a coefficient of performance, because the**

numbers were an order of magnitude higher than they needed to be. So we just wanted to understand, hey, if he has something, if there's an error, that's okay. We just have to understand what it is.

Q. Now, in here you talk about, "BW" -- Barry West, now I'm looking at Number 13 -- "reports to the plant and works regular hours on a four week on, one week off schedule. BW generally reports to the plant in the morning, approximately same time as Mr. Fabiani."

Now, do you know if he was generally working when Dr. Rossi was there?

A. I do not know.

Q. Okay. So you don't, did he ever have time in the plant that Dr. Rossi was not present?

MR. LOMAX: Objection to the form of the question.

Q. Do you know?

A. I'm not, I --

Q. Did you ask him?

A. As far as I was aware, there was a kind of a day shift and a night shift, and my understanding is that Dr. Rossi came in in the afternoon and then left kind of in the morning, and there was some overlap.

Q. Okay. But there were times when Dr. Rossi was not there?

A. I would imagine, yes.

Q. Okay. Now, you had testified before that Mr. Fabiani felt like he was being watched and Mr. West was uncomfortable to some degree, but why is it so when Dr. Rossi wasn't there for substantial periods of time that they were?

MR. LOMAX: Objection to the form of the question.

A. I think that both of them felt very intimidated. That was my perception of their description. They felt like they were being watched continuously while Mr. Rossi was in the building.

Q. Okay. Now, you put here that, "At one point Mr. Fabiani indicated to Barry West that he would cause him physical harm if Barry West interfered with the plant. The nature and motivation for this threat should be better understood." Did you ask him about that?

A. Did I ask who?

Q. Mr. West.

A. Yeah, we talked to him. We said, well, what was that about? He just said that, you know, he threatened him. And I thought, my feeling was that that is not an environment to be in. And I brought that to the attention of John Mazzarino and Tom Darden and JT Vaughn, that you don't want employees in that type of a

situation.

Q. Did, did you ask him about the facts or circumstances around that threat?

A. Not really.

Q. Problem I've got is we did speak with Mr. West. And as far as his relationship with Mr. Fabiani, it was all flowers and sunshine. So what I'm trying to understand is why this would appear in your report if Mr. West didn't indicate that to us.

A. I just documented what he said.

Q. So you have no independent knowledge of that?

A. No.

Q. And you have --

A. Only what he said.

Q. -- none of the facts or circumstances behind that?

A. No.

Q. So based on your understanding, do you have any reason to believe that Mr. Fabiani and Dr. Rossi were colluding to skew the results of this test?

A. No.

Q. What about Dr. Rossi and Mr. Barry West?

A. Not as far as I'm aware.

Q. Now, sir, you started drafting a report to undermine the testing protocol used by Dr. Penon, did you not?

A. **I never prepared any report to undermine anything. I prepared a report on a review of the documents that I was provided.**

(Whereupon, Exhibit 7 was marked for identification.)

Q. I show you, sir, a document marked as Exhibit Number 7. Have you seen this document before, sir?

A. **Not in this form. It looks, it looks familiar, but it doesn't seem like it's complete.**

Q. Did you prepare this document, sir?

A. **It appears to be part of a document that I prepared.**

Q. Well, it says that it's an appendix. Is there a larger document?

A. **Well, this was after the test, so I would imagine that there is more to this document, yes.**

Q. Do you know why it hasn't been produced?

A. **I have no idea.**

Q. Who asked you to prepare this document?

A. **After the visit on the 20 -- I'm sorry, on the 16th and 17th, Mr. Chris Pace of Jones Day asked me --**

Q. 16th and 17th of?

A. **I'm sorry. Of February of 2016.**

Q. Thank you.
A. I have to be careful.
MR. LOMAX: I'm going to instruct you not to divulge conversations you had with counsel.
THE WITNESS: Okay.
A. I was instructed to write down all of my notes and information about what I had observed.
Q. Who instructed you?
A. Counsel.
Q. Counsel for Industrial Heat?
A. Yes.
Q. I'm sorry. You were instructed to write down your notes and everything that you had observed?
A. Yes.
Q. Is there a more complete report other than this?
A. I believe that, you know, based on what's in here, there's lots of redactions and at least the front matter is removed. I'm still going through it, but yeah, there's a lot of redaction.
Q. Do you know why it would be redacted?
MR. LOMAX: Objection to the form of the question.
A. Because I prepared it for Industrial Heat's attorneys.

Q. Is it your understanding it would be used for litigation?

A. Probably. If the litigation were to, to happen.

Q. Does any of this form the basis of your opinions in this case?

A. Yes. These were my observations from what I had seen on those days.

Q. And do you reference these documents, or did you refer to them in preparing your expert disclosure?

A. I don't believe I did at all.

Q. So you did this great body of work and never referenced it?

A. No, I don't think I did at all. In fact, I think this is the first time I've looked at it in at least 10 or 11 months.

Q. Okay. Looking at -- I'm sorry. For the record, this is a document marked or bates stamped IH00120031. If you look at Page 4 of 39 of this document.

A. Oh, same one 4?

Q. Yes, sir.

A. Uh-huh.

Q. On the first paragraph, second sentence in you say, "As far as we can tell, none of the sensor data were logged digitally to an archive as required in the FPTP."

A. **Figure A2.**

Q. I believe it refers to temperature and volume flow rate of the return condensate and measurements of the input powder.

THE VIDEOGRAPHER: Six minutes.

Q. Do you see that sentence, sir?

A. **Yes.**

Q. Okay. What is the FPTP?

A. **It's the Fabio Penon test plan.**

Q. Okay. Do you know, sitting here today, whether any of the sensor data was logged digitally?

A. **The test, the data that I was talking about here was the volume flow meter on the volume condensate return line and the pressure transducer. As far as I'm aware, the information in the report was not logged digitally. I know that the flow meter was not logged digitally because Mr. Penon and Mr. Rossi, as we did the exit interview that day, indicated that they had never hooked up that interface.**

Q. Does it have an interface that could read digitally?

A. **Yes.**

Q. Okay. That particular flow meter?

A. Yes.

Q. What about the input power? Is that logged digitally?

A. That was logged to the power analyzer. So --

Q. So that was logged?

A. Yeah. It was not clear who logged it because the data between Mr. Penon and Mr. Fabiani are virtually identical. So it was not clear who was logging it or how it was being logged since Mr. Fabiani was not there continuously, how it was turned over. There, there's a limit to how long you can log. Who was doing that, who was resetting it, who was collecting that data was not clear.

Q. Okay. Now, looking just below that, Number 2, it says, "Temperature and pressure were measured. Note that the temperature data logger and sensor had expired calibrations."

A. Uh-huh.

Q. When did they expire?

A. They expired I believe, I would have to look back at the pictures, but they expired in January or February of 2016.

Q. So it was expired by less than a month?

A. About a month, yeah.

Q. How long are those calibrations good for?

A. **One year.**

Q. Okay. So if it was a year-long test, by the time it's hooked up on the plant, that's to be expected, isn't it?

A. **No, it's not.**

Q. How do you --

A. **When --**

Q. How do you do a 400-day test with an instrument that is calibrated every year without it expiring unless you swap it out, send it off somewhere for new calibration?

A. **So when you design a plant like this, there are really two things you do. For example, on a temperature sensor you would put dual redundant temperature sensors in a, a bung. There would be a bung hole in the pipe. You would screw it in. You would put the sensor into it, and you log both sensors. And then when it's coming to an intermediate point in the test, you can remove one of the sensors while the other continues to log and you can take that sensor, have it recalibrated and its logger recalibrated, and then you put that system, you put that back in while both are still --**

(Conference call interruption.)

A. **So you would, you would install dual. You**

would remove the one, have it calibrated while the other one is operational, put that first one back in, remove the second one and have it calibrated and then place it back in the system. It's a standard technique for, for systems, high availability systems.

Q. Okay. And that would be set forth in the test plan generally?

A. Typically, it would be set forth in a test plan.

Q. Okay.

A. And procedure. Actually, in the system design.

Q. And in fact, that was one of your complaints of Dr. Mizuno's work, was that he changed out some of the equipment --

A. Absolutely.

Q. -- in the middle of the test?

A. Yeah.

Q. Okay. Now, you say, "Also, the volume flow rate sensor was operated below the minimum operational threshold of the device throughout the entire test period."

A. Yes.

Q. Okay. We'll talk about that more later. I will come back to it. I promise.

Then another thing, you talk about the external water interface, that there was an external water tank that could supply water to the system, and the volume of the supplemental water was not measured?

A. That's correct.

Q. Okay. So --

A. There were no indication in all the data that I received that indicated when extra water was added or how much extra water was added.

Q. Now, the, the water in the system, the more water that was circulated, the more energy was put out, correct, from -- or I'm sorry, the more steam produced from that water?

A. I don't understand your question.

Q. Okay.

A. Can you restate it?

Q. The addition of water from that tank, would that have the effect of artificially increasing or decreasing the reported COP?

A. Would the addition of water? The issue with the water is understanding the mass or volume flow rate, so how much fluid is being pushed through the system, so actually it's a control volume analysis. So if you have a source of mass, of additional mass in the system, there's no telling what it is. You don't know how much

mass is in the system because the only place that the volume flow rate or mass flow rate was measured was in the condensate return line.

Q. Okay. Now I'm, I'm going to stop you there for a second. So this additional water tank, did, which side of the water flow sensor did it put water in? Was it putting water in that would be recorded by that sensor or that was unrecorded by that sensor?

A. Unrecorded by the sensor.

Q. Okay. So the addition of water from that tank, if more water was being added, would that affect the COP that was calculated for that system?

A. Would the addition of water at that point affect the COP? I would have to think about that. At this point --

Q. You can't answer that right now?

A. I can't answer that.

Q. Okay. So why did you raise it as a concern? Why did you raise it as a concern?

A. I'm sure that when I was writing this I had captured lots of thoughts, and I just can't recall.

Q. Okay. I think we need to go off the record for a moment.

THE VIDEOGRAPHER: We're off the record at 12:06 p.m.

(Recess taken 12:06 p.m. to 12:13 p.m.)

THE VIDEOGRAPHER: We are back on the record at 12:13 p.m.

BY MR. ANNESSER:

Q. Sir, we're looking at this report that you prepared, and I'd like to ask you to turn to Page 5 of 39.

A. Uh-huh.

Q. And there is a Section 3.2 flow analysis?

A. Yes.

Q. And in that you, you take issue and you say, "As described earlier, at most 37 percent of the reactors were potentially still operational. It is unexplained that the system maintained the same power output and the same condensate flow rate while over 60 percent of the power sources were disabled."

A. Yes.

Q. What is the total power that could be produced by that plant?

A. What was the total power?

Q. If it was running at 100 percent capacity.

A. I don't know.

Q. Okay. So if the total power was 10 megawatts, for example, if it's running at 10 percent it's producing a megawatt, correct?

A. If those numbers were correct, yes.
Q. Okay. So if it was 3-megawatt total possible power, at 37 percent it could be running at one megawatt, could it not?
A. If those numbers are correct, yes.
Q. But you don't know whether it's correct or not? You don't know one way or another?
A. I do not.
Q. Okay. So you would require more information to opine that that is, that that is incorrect, that it's not possible?
A. This report was a, me documenting all of what I saw and the information I had at the time, at this point in time almost two years ago.
Q. Okay. So you're not stating that the fact that it was running on 37 percent of the reactors is proof that this thing doesn't work, are you?
A. No.
Q. All right.
A. I'm saying that the behavior of the power in the diagram that comes up a little bit later on, or maybe it was before, when reactors went offline and the COP went up is very unusual, that they would be inversely, inversely related.
Q. Okay.

A. **It's very unusual.**
Q. Well, we'll, we'll talk about that. That's, that's an interesting one.
Now turning to the next page, 6 of 39.
A. **Okay.**
Q. You do some calculation regarding the Apator PoWoGaz, Model MWN130-80-NC, serial number blank.
A. **Uh-huh.**
Q. That's the one that was used for the test?
A. **It is, yes.**
Q. Okay. You say in here that this device uses a DN80 pipe flange. What does that mean?
A. **It's an 80-millimeter pipe flange.**
Q. Okay.
A. **That's what the manufacturer specified.**
Q. Okay. "If we consider that the test was nominally 350 operational days, the minimum required by the contract." What contract?
A. **The contract that was supposed to be overseeing this.**
Q. Okay. So you understood this was the guaranteed performance test pursuant to the contract that was being performed?
A. **No. Actually, Mr. Darden and Mr. Mazzarino highlighted that -- this was early on in June -- that**

this, in fact, wasn't the test. They wanted me to look and see if there was a one percent chance or a half a percent chance. And so they wanted me to go through and find out if this -- what was happening in this test. So I don't, I don't know about guaranteed performance test. I know that there was a contract, but I don't know exactly what that was.

Q. You refer here to, "If we consider that the test was nominally 350 operational days" --

A. Yes.

Q. -- "the minimum required by the contract." So it was understood to you --

A. Yes, yeah.

Q. -- that this was being compared to the contract provisions?

A. Right, but you, you said guaranteed performance. I, I don't know if this was guaranteed performance or not. I know that this --

Q. The 350 day test --

A. -- came from --

Q. -- pursuant to the contract?

A. -- the contract. Yeah.

Q. Okay. Now, I want to turn back for a moment to, and I apologize I did not mark the exhibit, your summary of the Swansboro meeting.

A. Yes, 6.

Q. Thank you. On the second paragraph you say, "The data reviewed in support of the proposed July 2014" -- I'm sorry -- "July 14 introduction and plant tour included background contract documents" -- which I asked you about.

A. Right.

Q. -- "request for invoice from Henry W. Johnson, President of JM Products"?

A. Uh-huh.

Q. All right. "And reports from LI's consultant and advisor Dr. Fabio Penon."

A. Yes.

Q. Why do you refer to him as LI's consultant and advisor?

A. That's how he was presented, that he was the advisor and --

Q. Who told you that?

A. Mr. Mazzarino, Mr. Darden, Mr. Vaughn.

Q. All three of them?

A. Yeah. In the meetings they discussed him, they discussed him as that, yes.

Q. Okay. Did they ever say he was the ERV for this test?

A. I've heard the term ERV, but they actually

told me that there was no ERV because it wasn't mutually agreed upon.

Q. Okay. And when did they tell you that?

A. In, when I began doing the analysis in June of 2015.

Q. So they knew as of June 2015 that this was not -- or they did not consider him the ERV?

A. They described it to me that way, yes.

Q. Do you know if anyone ever told Dr. Rossi that?

A. I do not. In fact, I, I don't believe that they did.

Q. You don't believe they did?

A. I do not.

Q. Why, why do you say that?

A. I just, I don't remember anybody saying that we, you know, that they had definitively said that. I, just my sense was that they had not.

Q. Okay. Why would that be? Why wouldn't they tell him, hey, we didn't agree to this guy, what, what are we doing?

A. I have --

MR. LOMAX: Objection to the form of the question.

Q. If you know.

A. **I have no idea.**
Q. Okay.
A. **Yeah.**
Q. Now, sir, looking at Page 6 of 39 that we were on in Exhibit --
A. **7.**
Q. -- 7.
A. **Yes.**
Q. Okay. So continuing there, you talk about, "...the minimum required by the contract. This would suggest that each day was approximately 34.1 cubic meters per day of volume flow rate." Okay. And you go through a calculation, which I'm, I'm not going to read all of it.
A. **That's fine.**
Q. And down at the bottom it says, "Comparing that with the average of the mass flow rates provided by P" -- Penon?
A. **Uh-huh.**
Q. -- "results in a less than .6 percent error between the two values."
A. **Uh-huh.**
Q. What does that tell you?
A. **That they're consistent.**
Q. Okay. So that's consistent with what, what's

being reported?
A. **The --**
Q. Those numbers are consistent with what's being reported?
A. **The data that's being, that was provided in the reports by Penon was consistent with the numbers that I had seen in the plan, yes.**
Q. Okay. Any reason to believe that they were not?
A. **Any reason to believe they were not what?**
Q. That, that they were not correct, the numbers that you saw in the plan.
A. **I just saw the aggregate number.**
Q. Okay.
A. **So yeah.**
Q. Now, on the next page.
A. **Which page, Page 7?**
Q. Yes.
A. **Uh-huh.**
Q. Page 7 of 39. The, the first paragraph is really just a description of the figure, which we can't see, but the first full paragraph talks about the minimum flow rate for the flow gauge?
A. **Yes.**
Q. Okay. And because the minimum flow rate was

below that of the average flow --

A. It was above that.

Q. I'm sorry. The minimum flow rate was above the average flow reported by Dr. Penon, you conclude that all of the volume flow rate sensor measurements are invalid?

A. That's correct.

Q. What happens when you fall below the minimum flow rate?

A. These devices are designed to operate with a full, completely full pipe. And they're actually designed to have a valve on both sides of them. And when the flow meters operate below that, you can get inconsistent results. For example, you can actually have just a very minor amount of water in the channel, and it can turn the turbine wheel to indicate a much, much higher volume.

So this particular meter was actually designed for a flow rate, a nominal average flow rate of about 40 meters cubed per hour, but it was operated below its minimum point. So you can't make a valid measurement when it's operated below the minimum point.

Q. Okay. Let's talk about this for just a minute. To begin, when it is operating within its minimum and maximum flow rate, this, this meter, what is the margin of error?

A. The, these devices, it's, it depends upon if you're in the transitional region or you're above it. You, I would have to look at the type certification from the manufacturer to know.

Q. But you don't know sitting here today for this particular device?

A. No.

Q. Okay. Now, if you operate outside, is it your understanding that the margin of error increases?

A. Yes.

Q. Okay. Did you ever do any testing on the actual flow meter that was used for the Doral facility 350-day test, what we're calling the guaranteed performance test?

A. The --

MR. LOMAX: Objection to the form of the question.

MR. ANNESSER: What's the objection?

MR. LOMAX: To the extent that it gets into any kind of attorney work product or attorney-client privileged information.

Q. Okay. Go ahead and answer, sir.

A. Repeat the question.

Q. Did you do any testing on the actual flow

meter used during the guaranteed performance test?
A. No. That flow meter was taken by Mr. Penon back to Italy --
Q. Okay.
A. -- at the end of the test. I took pictures of it and collected data on what it was.
Q. Okay. I'd like to ask you to turn to Page 9 of 39 of Exhibit 7.
A. Uh-huh.
Q. And you continue to discuss the flow meter here I believe. And the last sentence of the paragraph on this page states, "In addition, we have estimated that the visible portion of the pipe has about five elbows and one DN40 valve."
A. Uh-huh.
Q. What are elbows?
A. Elbows are pipe elbows. So right angle or 45-degree angle turns in a pipe.
Q. Okay. Where were those elbows that you were --
A. On the inside of the container on the steam side.
Q. On the steam side, okay.
A. Yeah.
Q. How do you know what the inside looked like?

A. Because at the end of the test you and I and everybody else there had an opportunity to walk through and take pictures of and inspect everything on the inside of the container.

Q. On the steam, on the -- I'm sorry.

A. I'm saying on the reactor.

Q. Okay.

A. It should be located --

Q. On the reactor?

A. Yeah. Near --

Q. Okay.

A. -- the BF units at the back of the reactor, all of the pipes coming off were what I believe are DN40, 40-millimeter pipes. I actually have a picture of a pipe joint that actually flags it as a DN40.

Q. Okay. And those feed into a larger pipe, correct?

A. They feed into a main, and then the main goes across to the Johnson Matthey facility.

Q. Okay. So, okay. So here you're talking about the steam flow --

A. Yeah. We're talking --

Q. -- that was --

A. Yeah.

Q. Okay.

A. The, the product steam of the reactors.
Q. Product steam of the reactors. And it goes into what interior diameter pipe to go, once it exits the reactor?
A. I suspect it was a DN80, but I don't know because it was covered by insulation.
Q. Okay. But you, you talk about it's about seven meters long?
A. Uh-huh.
Q. From the exit of the reactor ISO container to the location where the pipe kind of --
A. Right.
Q. -- penetrates the JMP wall?
A. Right.
Q. And then you say, "In addition, we have estimated the visible portion of the pipe has about five elbows and one DN40 valve."
A. Yeah.
Q. So, okay. So in one respect you're talking seven meters on the outside of the reactor?
A. Uh-huh.
Q. And then when you refer to the visible portion of pipe has about five elbows, that's on the inside of the reactor, correct?
A. Yes.

Q. That's --
A. Not on the inside of the reactor. It's on, it's the output of the reactors to go into the manifold that feeds the full system going across.
Q. Inside the shipping container?
A. Yes.
Q. Okay. And then you say, "It is assumed that the steam system is DN40 because the flow valve shown in Figure A."
A. Yes. On the inside of the reactor, yes.
Q. Okay. This doesn't say inside. Sorry. I misunderstood it.
A. This was a preliminary report. I just wrote all of my data down as fast as I could to get all my thoughts into a file.
Q. How do you measure COP? What is the formula to measure COP?
A. Power in over power out -- I'm sorry. Let me think about that. Power out over power in.
Q. Okay. So --
A. It could be energy in over, I'm sorry, energy out over energy in as well. I mean it depends on -- I never saw the actual computational worksheets of Mr. Penon, so I don't --
Q. Did you see the formula he used?

A. I saw the formula in the document, but we never saw the worksheet.

Q. Yeah.

A. So we just reproduced it and came up with values that were very similar to his.

Q. Okay. So your, your values were similar --

A. Based on his data --

Q. -- to --

A. -- yes.

Q. Okay. So you're not saying he did any improper calculations or anything to arrive at his --

A. As far as I'm aware, the calculations were consistent.

Q. Okay. Now, so you ultimately visited the plant in Doral, correct?

A. I visited the plant twice in Doral. Once on the, I believe it was the 16th and 17th, and then subsequently we came back and made some additional inspections. I don't remember if it was March or at some point after that.

Q. Now, you were permitted to speak with Dr. Penon at the plant, correct?

A. Yes.

Q. Correct?

A. At the end of the test I had a, what I would

describe as an exit interview to find out his thoughts on some of the factors.

Q. Okay. And what did you ask him?

A. I asked him a series of questions about how the system was closed relative to the first and second law of thermodynamics and conservation of mass and conservation of energy. I asked him questions about the calibration of the data. I asked him about whether or not the, any modifications had been made in the plant between the 16th and the 17th, if anything had changed.

Q. What did he say?

A. He said not that he was aware of.

Q. Okay. What about the, the closed system?

A. It was specifically related to understanding what was on the other side of the wall. I asked him how do you close the system if you don't know what's on the other side of the wall? And he said, well, we have the flow meter on the one side. And, and I asked him specifically that if, how was he going to determine what the state of the steam was and the state of the condensate? Because he didn't have temperature, pressure, and volume or mass flow rate on both sides. There was no measurement, as far as I'm aware, of the steam flow rate on the output side of the system.

Q. Okay. So let me take a step back. He did have measurements of the temperature of the steam and the steam line going out of the E-Cat plant over to the JM site, correct?

A. Yes.

Q. Okay. Do you know how many?

A. I believe it was two.

Q. Okay. Do you know where they were located on the plant?

A. I don't.

Q. Okay. What -- okay. Now, you said the steam quality. What does that mean?

A. So steam can be in, depending upon the thermodynamic state, the pressure, the temperature, and the mass or volume flow rate, steam can be any level of between the two phases of water, heated water and fully saturated steam. If you don't have that information, you can't determine what the enthalpy and entropy of the steam line is.

So in this system we didn't have a measure of the steam flow rate. We had a measure of the pressure that Mr. Penon provided, but he indicated in the final report -- this was all before the final report I should note. He indicated in the final report that the pressure was zero bar, and bar is an absolute measure of pressure. So zero bar would be a perfect vacuum. You

would have to indicate that it's pressure relative or pressure gauge. So normally somebody would say bar G or bar relative. And so what you --

Q. What did he report?

A. In the report what I saw was bar. And so, so we know that has to be a typo or an error or something has to be wrong there.

Q. Well, it could be bar gauge or --

A. If he indicated it was bar gauge, then it would say bar G or bar-G or bar relative or -- it could be a lot of things. It was a, it could be a typo. It could have been an error. It could be a misinterpretation, whatever.

So when we left the, when we inspected the equipment at the end, I inspected the volume flow meter, and I inspected the pressure gauge that he indicated was used for measuring the steam pressure. That's where he had that zero bar measurement. And so I wanted to understand what are these devices. And so what I did was I went out and I got the manufacturer's information and the manufacturer's type certifications to find out what their capabilities were.

And specifically on the pressure side he used a pressure meter that was actually only operational between 0, or I'm sorry, 20 and 50 degrees C, but he was

measuring steam temperature of 100 and let's say about 102 to 104 degrees C. So the pressure sensor was not operating in its operational range, and the volume flow rate sensor on the condensate line was not operational in its, in its range. The temperature sensors, I think they were fine. I believe they were K type thermocouples, and they logged those to some type of a device. But it was just a series of errors.

Q. Can you have liquid water that is 101 degrees Celsius at zero pressure?

A. If zero pressure, give -- which pressure?

Q. Relative.

A. Relative. No, you wouldn't normally have that, but --

Q. What about gauge?

A. That's the same. Relative is --

Q. Okay.

A. Absolute?

Q. What about absolute? Sorry.

A. Oh, you could -- you would not have at a, at a pressure of zero absolute, your water would absolutely be a gas.

Q. Okay. And so at relative or absolute, or gauge or absolute, water could not be at the temperature of 101 degrees Celsius in the liquid form --

A. So we --

Q. -- correct?

A. Well, I would have to look at the thermodynamic tables and look at exactly what the, the state is. We don't know what the flow rate is. We know what a temperature is, and we know we have a pressure measurement that is outside of the operational range of the pressure transducer.

Q. Sir, I'm, I'm asking you, if you have zero relative pressure or zero absolute pressure, whether water can exist in its liquid form at 101 degrees C.

A. No.

Q. Okay. So is it your understanding, sir, that Dr. Penon put one of the temperature gauges at the bottom of the steam pipe and one at the top?

A. I don't know where he had, I don't know where he had those.

Q. Okay. You don't know sitting here today one way or another?

A. I don't know where they were, no.

Q. Would you agree with me, sir, that if the, if there was a sensor at the bottom of the pipe and it recorded consistently temperatures over 101 degrees C, then it was not submerged in water?

A. I would not agree with you.

Q. Okay. Explain.

A. So it is not possible to take atmospheric pressure, zero bar or 14.7 PSIG or PSIA water and expand it into steam, which has an expansion ratio of 1700 to 1, and put it through a system and not have a pressure increase. You're expanding water by a factor of 1700 to 1.

So what that would require is that on the other side of the plant they would actually have to have a, a pressure of, a vacuum pressure on the other side of the plant, on the other side of the wall to draw that steam across, because that steam has to go through all of this network of pipes where there are losses. The bends in the pipe introduce losses. And it causes the, the steam to degrade. It will, it will condense. It will, it will turn into water. And you have to have a pressure. So that is why I wouldn't agree. You would have to have a completely defined thermodynamic state to be able to say that.

Q. Okay. I know you, you have your doubts, but what I asked was not specifically with respect to this.

A. Okay.

Q. If there is a pressure sensor on the bottom of the pipe and it is consistent, let's say there's open ends except for the side that has steam supplied to it, 5-foot pipe with a pressure sensor at the bottom that consistently reads 101 degrees C.

A. I, a pressure sensor doesn't read --

Q. I'm sorry. I said pressure sensor. Temperature sensor. You're absolutely right.

A. Okay.

Q. Temperature sensor that reads 101 degrees C, can there be water sitting on top of it, sir?

A. And can you give me the rest of the, this, this kind of scenario? What was the pressure?

Q. Zero.

A. Zero. So in that case you would still have a loss of energy into the surrounding, which would cause condensation on the inside of the pipe, and you would collect water at the bottom. That's why you have --

Q. And that would lower --

A. -- steam traps.

Q. That would lower the temperature, would it not?

A. No, no. The, because you're accumulating a pool of water, and so your rate at that point -- water does not convert to steam exactly at 100 degrees C. It's a, it's a process that goes between the, the system entropy. It's the total process. So it would, it would require -- it would be impossible to know without having

a proper steam trap at the bottom.

Q. So in one respect you've told me that water in its liquid state cannot exist at atmospheric pressure in liquid form at 100 degrees C, right?

A. Say that again.

Q. Water in its liquid form cannot reach the temperature of 101 degrees C at atmospheric pressure, correct?

A. It's not that simple. It's --

Q. What about 102 degrees C?

A. It's not that simple. There, you can have water at 200 degrees C --

Q. At atmospheric?

A. No. Depending upon the pressure --

Q. You're --

A. -- and the amount of column you're accumulating.

Q. Sir, I --

A. It depends on the geometry and the specific nature of the system.

Q. I, I can tell you don't want me to agree with me, but I'm asking you specifically at atmospheric pressure.

A. And at atmospheric in a, in an idealized world where you don't have real pipes and you don't have

real, a real system, then the, theoretically you would say that at 0 PSI, absolute or relative -- at 101?

Q. 101.

A. -- 101, you should have steam.

Q. Now, when water condensates within the pipes and returns to a liquid state, that water is below 101 degrees, is it not?

A. It depends on how much pressure accumulates. So water has head.

Q. Zero atmospheric pressure, sir.

A. Okay. But --

Q. We're --

A. -- accumulation --

Q. Let's stay consistent.

A. Right.

Q. I'm not asking about the world of information.

A. Accumulation of water creates head. That, that's pressure. Right, so (rho)gh. So you can accumulate water at a temperature, and that's why in a steam system you have traps, so you can trap that water and get it out of the system because you don't want to transmit wet steam to another system.

Q. But that water has dropped below 101 degrees Celsius?

A. **No, because the pressure in the water, as you accumulate it, it builds pressure on the water. So you could, you could go up slightly. You could go to higher temperatures.**

Q. How high?

A. **We would have to understand the head, and we'd have to understand the specific geometry.**

Q. Did you do any of those calculations, sir?

A. **I didn't have any of the design, the detailed design documentation or red-line design documentation for the plan.**

Q. Okay. Now, sir, you requested at some point of Engineer Penon the reports and test plan and everything that was in place for the plant; is that correct?

A. **While we were there, yes.**

Q. While you were there. Did he ever send it to you?

A. **He sent me some documents by e-mail I think probably in, probably in March of 2015.**

Q. Okay. When, when did you meet him again at the plant? The January -- I'm sorry, February?

A. **February 16th and 17th, I think --**

Q. Okay.

A. **-- those were the two days.**

Q. Do you know --

A. Might have been the 15th and 16th, 16th and 17th.

Q. Do you know why it would have taken him so long to send those to you?

A. I don't know.

Q. Okay. Maybe it's because he didn't take so long to send them to you?

A. Maybe he sent them sooner. I don't know.

Q. Okay. Yeah. Let's look at a document we'll mark as Exhibit 8.

(Whereupon, Exhibit 8 was marked for identification.)

Q. This e-mail appears to be from Fabio Penon to yourself --

A. Yeah.

Q. -- Mr. Darden, and Dr. Rossi on February 23, 2016?

A. Yes.

Q. So a few days later, less than a week?

A. Yeah, about that. Yeah.

Q. Okay. So he, he didn't hesitate in sending those to you?

A. No.

Q. There was no delay whatsoever?

A. Yeah.
Q. And he includes, among other things, the energy plant in Miami test plan, plant start-up, first step, second step, and second step with different dates, correct?
A. That's what he indicates, yes.
Q. Okay. So looking at the second page of this document, which we have now marked as Exhibit 8, there is a picture.
A. Uh-huh.
Q. What would you call it, a configuration?
A. I would call it a block diagram.
Q. A block diagram. We're going to use your term because it's probably correct. Now, sir, you had this block diagram previously, had you not?
A. Uh-huh, uh-huh.
Q. Okay. What is --
A. Or it was something very similar. If it wasn't this one, it was very similar, yes.
Q. So what is it that you didn't have in terms of the setup?
A. So we don't know how many valves, how many elbows, pipe size, the insulation surrounding these things. We don't have anything. We don't know -- I don't see in here where the flow meters are, how he's

closing the state of the system.

Q. Did you ever request that specifically of him? Send him an e-mail and say, hey, I need to know where the, where the elbows are, how many --

A. So this was after the system was shut down as a post system test. So normally in any plant of this magnitude you would have drawings or specifications, and you would have red-line drawings. So where modifications were made, people would red line. And that's perfectly acceptable engineering practice to red line. If you change something or if you modify something, you would red line it so there was a record of what was changed and done to the system during its existence. So I would have expected that at the plant we would have had detailed as-built drawings with red-line information.

Q. That's what you would expect, you said, right?

A. Yes.

Q. Okay. Did you ever ask for it, is the question.

A. I did, yes.

Q. When?

A. When we were sitting at the exit interview I asked him. I, in fact, when we arrived on the 15th or

16th, I don't recall which day --

(Phone ringing.)

A. **-- I asked for that information.**

Q. All right.

A. **And, and then at the exit interview I, I specifically asked where are the red-line documents, where is the as-built drawings, all that information.**

Q. Now, by this point, okay, you're talking February 2016, you had been employed with Industrial Heat since May 2015?

A. **Yes.**

Q. So you're talking about nine months, give or take?

A. **Uh-huh.**

Q. And that was the first time that you ever requested that information from Engineer Penon?

A. **Yes. It was the first time I had ever actually met him, was that day.**

Q. Could you have e-mailed him?

A. **I didn't have his e-mail address, but I did ask T. Barker, Tom Darden, JT Vaughn, on repeated, repeated occasions for that data. I said there is no way we can evaluate a plant without this documentation. They gave me what they had, but in my opinion it was a complete failure that all parties involved did not have**

adequate engineering data for this program.

Q. Okay. So, so this first document, IH00011096, which is identified as E-Cat MW1 Energy Plant in Miami, Plant Start-Up?

A. Uh-huh.

Q. Correct?

A. Yeah.

Q. You had seen this?

A. I had, I had seen a version or some variant of it. I don't know that I had seen this exact document. Excuse me.

Q. Do you have a reason to believe that there was some other version of it?

A. Well, all of the documents kind of had the same template and form. And, you know, every, every time that Mr. Penon would submit a document they were, they were kind of similar. So he would repeat the diagrams and, you know, keep sending them in. So I couldn't say if I saw this one or if I saw, you know, the one that was submitted in April or whatever, but one of them. It was very similar to this, yes.

Q. Well, you were, you were saying you, you know, as of July 18th when you had that meeting with Barry West, you had no idea where the or how the test was set up or how the plant was set up?

A. No, I didn't say I had no -- what I said was I had no idea where the volume flow meter was and if there was a steam flow meter. This is the document that subsequently, and I believe it was actually when Mr. Penon sent this to me that I found the flow meter Adaptor M, MWN130-80NC. Had I seen this before, that would have been a great question to ask, you know --

Q. So why --

A. -- what is this.

Q. Why is it that Industrial Heat didn't show that to you before?

A. I have no idea.

Q. They had it --

A. Yeah.

Q. -- clearly.

A. I mean it may have been one of the documents that was provided in the, you know, in the information I had, but I did not notice that.

Q. Turning to the second page of this document, bates number IH00011097, not only does it identify the flow meter down at the bottom, does it not?

A. It does, yeah.

Q. But it also points to the location of the flow meter. Do you see that in the diagram above?

A. Yeah. That's weird. I actually have never

noticed that before.

Q. So had, had you wanted to, you could have taken a look at that and called Barry West and said, hey, look on the pipe, but you didn't?

A. No. We did not.

Q. And in fact, if you turn to the next page of this document, it lists all the other equipment that was being used, correct?

A. Yeah. And this is really where we started to have other issues. For example, the digital manometer, Kelly -- or Keller, Type LEO 1, that's the device that only has an operational temperature up to 50 degrees Celsius on the steam line. And furthermore, when you go down, this document was dated -- let me see what the date is on the front of this. Oh, it's not dated. Do we, do we know what the date is on this document?

Q. E-mailed 5/28/15.

A. No, no, no. I'm saying when the, the document was actually produced to Industrial Heat originally.

Q. 5 --

A. Oh, there it is. I'm sorry. There it is. Is it -- right here, 2/10/2015. Now, if you look down here under identification of electrical measurement equipment and you look down there on the power analyzer,

the thing that struck me was that the calibration date for the power analyzer is April 20, 2015. Fully three months after this document was supposedly produced.

Q. Actually, sir, I want you to look at something. This is the plant start-up document, correct?

A. Yeah. That's what I just asked, was --

Q. Yeah. And look, plant start-up document was e-mailed 5/28/2015.

A. 5?

Q. Oh, and -- 5/28/2015.

A. So --

Q. Now --

A. -- test plan, oh, I'm sorry. This is out of order.

Q. Sir, and I --

A. I'm sorry.

Q. I want to point something out to you. You had described this system where there were, for testing equipment where there were two, I think you said with a --

A. Redundant.

Q. -- connection or redundant?

A. Yeah.

Q. There's two power analyzers here, aren't there?

A. **That's correct.**

Q. Yeah. The, the first one has a issue date of 1/28/15, does it not?

A. **It does.**

Q. Okay. And one with a later issue date, because they're good for a year, correct?

A. **That's correct.**

Q. And so that's what you would want to see, correct?

A. **Absolutely.**

Q. All right. So that, that's --

A. **So --**

Q. -- what you would want to do?

A. **Absolutely.**

Q. Perfect.

A. **So this -- where is the test plan? This, is this just out of order?**

Q. It may be.

A. **Okay. Let me just take a quick look. Because what we noticed was that, in fact, in the documents they showed an earlier document that there were meters, and we were questioning how could you have a meter in an earlier document. Boy, where is that? That's second step. Maybe it's further back. Test**

plan.

Q. Yes, it is document number 00011128.

A. There it is, yes. So if you look at this, in this plan they indicate the first unit and no second unit. And then if you go back and we just compare --

Q. Where are you looking, sir?

A. I'm sorry. I'm looking at IH00011129. And I'm comparing -- which was the test plan. I believe this was the document from February of 2015.

Q. Uh-huh. Yeah.

A. So if we look at this and we start to compare the sensors, we have a flow meter, which in this one is, the detailed information is not provided. So we had no means in February of 2015, which I was not in the company at this point, to know what the flow meter was.

Q. Did they ever ask for the flow meter information?

A. I have --

Q. And by the way --

A. -- no idea.

MR. LOMAX: Objection to the form of the question.

A. Okay. I have no idea.

Q. Okay. And it says test report number 0120-15 dated. So that, that's a defined piece of equipment.

Did they ever ask for that? Do you know if they had that report number?

A. I have no idea what they asked for.

Q. Do you know if --

A. But I know that I saw this, and I did not know what this was, and I never saw a test report.

Q. Do you know if they had the test report, sir?

A. I do not.

Q. Okay. So did you ask, did you ask Mr. Vaughn or Mr. Darden --

A. Absolutely.

Q. -- for that test report?

A. Yes, I did.

Q. Okay.

A. I asked them for all documentation related to this test.

Q. Okay.

A. And if we just keep going down and we look at the power analyzer, so what we see is there is a PCE-830, calibration certificate 05/18/15.

Q. Yeah.

A. That's the first one.

Q. Yes, sir.

A. So at some point in, along the way they switched power analyzers, which actually, if they were

running them redundantly, that would have been fabulous, so they would have had that data. But, in fact, what happened was at some point along the way in the time frame of about April they removed one power meter and substituted the other one. I suspect, and I'm not suggesting that something nefarious or anything bad happened, I suspect that the unit failed and so they replaced it, which is fine.

Q. Hold on.

A. Okay.

Q. We discussed this system, this duplicative system where you have two meters.

A. Absolutely.

Q. And you said, your words, that you would remove the one before or as it expires, the certification --

A. Yeah.

Q. -- and the other one would remain in place so that you had continuous monitoring?

A. Absolutely.

Q. And yet you flaw -- now --

A. I'm not flawing.

Q. Hold, hold on. Dr. Penon had indicated in a test plan, which is before the test started, February 2015, that he had the initial calibration certificate

0518-15 dated January 28, 2015, for the test meter, correct?

A. That's right.

Q. Okay. So that was the one -- but mind you, if the test started in February, that --

A. It would have expired.

Q. -- would have expired --

A. Absolutely.

Q. -- during the course of the test?

A. Absolutely.

Q. Okay. So it's odd to you that there was a second test meter that he got certified in, what is it, April of 2015? If you look at --

A. Yeah, about April. April 20th.

Q. April 20, 2015, so there would be no time period where there was an expired certification?

A. No, no, no. What I'm -- I am not saying that that is bad practice. What I'm saying is that this meter that he identified with the calibration was not on the premise. I, that was not available to me at the end of the test. When I took pictures of all these instruments, it was only the second one.

Q. Well, do you know if it was being sent back for recertification since it had expired by that point in time?

A. I have no idea what it was.
Q. Or for --
A. It was not on the facility. It was not at the facility.
Q. Or for testing?
A. I have no idea what their plan was.
Q. Do you know if that equipment was ever certified?
A. What equipment?
Q. The equipment used for this test, any of it.
A. You know what, this week there were a bunch of documents that came through, but they were all, some of them were in Italian, so I didn't have a chance to review them.
Q. Okay.
A. But just to continue here. If we look at this, the other sensors that are reported here in the plant start-up are still different than the sensors that are shown here in this list. So we have a HT -- HSTC-TT-TI-24S. That's there. Okay. That's a digital thermometer.
Q. Okay.
A. From Omega. And we have a TC-T-NPT-U-72-SMP, which is the sensor, which is not identified here.
Q. I believe it is.

A. I'm sorry. Actually down below it is. If you look at the, the TU-T-NTP-U-72, that is over here on the Omega steam pressure measurement.

Q. Yeah.

A. I'm sorry, steam temperature measurement. And then we look for the Keller LEO 1 steam pressure.

Q. Where do you see the Keller LEO 1?

A. In the plant start-up.

Q. Okay.

A. That's the pressure sensor that Mr. Penon indicated was used for making pressure measurements.

Q. I'm sorry.

A. I'm sorry. Yeah, we're crossing documents here, so.

MR. LOMAX: It's probably better if you reference the page.

A. I'm sorry. Let me reference the page. So on IH00011098, the digital, the third bullet down is digital manometer Keller --

Q. Okay.

A. -- Type LEO 1 with a certificate. And the issue date, interesting enough, a full month after the test started they added on another sensor, which is fine. There's a redundancy there. So to your point, that's a good thing. The only problem is that it's not

appropriate for this application.
Q. The, the second one?
A. The digital manometer, that's correct.
Q. Okay. But the first one was?
A. Yeah. We don't know where the -- this is the device that Dr. Penon indicated was used to capture the pressure data for the system. So I'm not saying that he was lying or misleading me or anything else. I'm just saying that these sensors were not appropriately selected. They were not appropriately sized, that collectively some of these sensors were not appropriately selected or sized for this system.
Q. Sir, and I understand that you take issue with the test plan in this case.
A. Yes.
Q. I understand that and it certainly could have been more robust, but this was no secret. This is information that --
A. Absolutely.
Q. -- Industrial Heat had?
A. Absolutely.
Q. Okay.
A. I, I fault everybody. I think it was poor engineering and just overall an inappropriate way to do it.

Q. We can agree on something.
A. That's, that's for sure.
Q. Fault everybody. All right. Do you feel that Mr. Penon has hidden any information from you?
A. No.
Q. Okay. Do you --
A. I think he's been quite transparent.
Q. Do you feel Mr. Fabiani has hidden any information from you?
A. Yes, I do.
Q. What information?
A. Well, he committed to providing us data that he said he had encrypted and stored on a server in Russia, and he committed to providing us with a final report. And so I feel that he was not being transparent with us in providing us the information in a timely way.
Q. Has he provided those now?
A. I don't know. I, I'm, really I'm not -- I saw --
MR. LOMAX: Objection to --
A. I'm not sure what they provided.
MR. LOMAX: -- to the extent it gets in to communications with counsel.
Q. You have never seen them?
A. I have seen -- I have not reviewed the

detailed data. I have seen a couple of files. I haven't reviewed them, but I have never seen a final report by Mr. Fabiani.

Q. Was he engaged to do a final report?

A. Yes. And he said he was producing a final report. He had it almost complete. He was doing a final few things, and he was going to provide that to us in about March of 2016. I gotta get my years right.

Q. In the work that you do, sir, when the new client comes in, do you tell them how much the project is going to cost?

A. Uh-huh.

Q. Do they pay you something before you begin work?

A. No.

Q. They don't?

A. No.

Q. It's a bill as you go?

A. Most of the work that I do is with Department of Defense, and they have very rigorous accounting and payments terms.

Q. Okay.

A. In almost every, in almost every aspect.

Q. And you're pretty secure you're going to get paid. It's the government, right?

A. Yeah.

Q. It may not be fast, but it's --

A. Yeah.

Q. -- going to come.

A. Sometimes they're fast, yeah. And I often work for other companies, and most of the time the, the payment terms are paid when paid or paid within a certain number of days when paid.

Q. Okay. Have you ever worked for a customer or a client that you did work for and then they didn't pay you?

A. Yes.

Q. Okay. Did you continue doing work for them?

A. In some cases, yes.

Q. And others no, right?

A. In others no, yes.

Q. Okay. And that's because they hadn't paid you?

A. Yeah. It depends on the circumstances. It depends on who it is and what the circumstances are relative to the ultimate customer.

Q. You can understand why somebody wouldn't want to do more work for you if you hadn't paid, right?

A. I would think that would be reasonable.

Q. Now, Mr. Penon, you, you sent him a series of questions I guess or issues with the test data that you observed; is that correct?

A. Yes.

Q. How did he respond to you?

A. My recollection is that I sent that data to him before the final report was issued. And he did, I don't believe he responded to my questions, but then he issued the final report just some days later. Maybe, I don't know, maybe it was a week or two later. I don't recall exact dates.

Q. Do you recall him telling anyone at Industrial Heat or yourself that he has been available to Industrial Heat and the Leonardo Corporation to answer questions throughout the course of the test and at the end of the validation; in fact, he answered your questions and that the final report had concluded his work?

MR. LOMAX: Objection to the form of the question.

A. It sounds familiar, yes.

Q. Okay. Do you know if he was engaged or offered more money to answer additional questions that you had?

A. I have no idea.

Q. Okay. Sir, I'm going to kind of jump a big step back from where we've been at for a minute.

A. **Okay.**

Q. In the beginning of this deposition you mentioned two publications that were part of your masters program?

A. **Yes.**

Q. But you don't recall the names of those right now?

A. **No, I don't.**

Q. Okay. Have you published anything else within the last 15 years?

A. **Yes. There were publications associated with my PhD research. I have presented data which was ultimately published to multiple NDIA, National Defense Industry Association, conferences and proceedings on -- slow down?**

Q. I'm sorry. You presented data to them, or you formed a publication? I --

A. **I --**

Q. What I'm looking for is any document that's going to list you as the author.

A. **So I, I was requested to present to a conference proceeding, and then subsequently they produced those. So they were NDIA presentations and numerous technical reports and final reports for**

government purposes, which are published inside of the government, but usually confidential information.

Q. Okay. What were those reports on?

A. Virtually every form of system or research activity that we had completed.

Q. Can you give me the names of any of those reports?

A. I could give you, yeah, many. I mean the final reports for, boy, there are probably 50 --

Q. Okay.

A. -- that were published to the government.

Q. Are any of these available for me to see, or do you have copies of them?

A. I think actually if you search the, the web under my name as a principal investigator on SBIR final reports, I think a lot of that data is actually published.

Q. Do you maintain copies of those?

A. Usually, no. Usually, they're proprietary to the company that I was working for, and so I do not maintain copies of those.

Q. Now, you didn't provide us a list of all your publications within the last ten years, have you?

A. I have not, no.

Q. Okay. Are any of those publications germane to your opinions in this case?

A. I don't know. It's hard to, it's hard to say. I'm, I would have to go back and review everything to find out.

Q. Sitting here today you can't think of one that is?

A. I can't think of anything that I would.

Q. Okay. What about any publications prior to the last ten years? Would any of those be germane to the work that you've done in this case?

A. Yes.

Q. Which ones?

A. When I, as I described, when, when I was at General Motors working on the steam plant, that program was actually a cost savings program. And what was happening, briefly, was that the steam plant was basically pouring open steam into the heat exchangers of a large facility, about a million-square-foot factory. So I prepared an analysis and came up with an automated technique to modulate those, the steam plant to reduce the, the energy consumption.

At the end of that project I turned that all over to another engineer who actually jointly, with my name on it, published it. And it, it was published. I believe it was ASME. It's been a long time ago. And

actually ended up saving, the savings was millions of dollars inside of the steam plant at that facility, and it was, that engineer actually received an award for it based on the work that I had done previously.

Q. Okay. So do you know the name of that publication?

A. I do not. It's been --

Q. Do you have a copy of it?

A. No.

Q. Okay.

A. It's been many, many years.

Q. Have any of your documents or reports that you've published been peer reviewed?

A. Yes.

Q. Which ones?

A. My masters and PhD work.

Q. Now, you didn't do a dissertation in your PhD, did you?

A. No. My dissertation was about half complete, and then I went to work.

Q. So tell me about the PhD publications that were peer reviewed.

A. So I published an article in Physics of Fluids, I don't remember if it was A or B, and it was a peer-reviewed journal article on actually sub-grid scale

physics modeling. It was actually the basis of my PhD dissertation.

Q. Okay. Who was it reviewed by?

A. The editorial board for either Physics A or Physics B.

Q. Okay. So it was reviewed by an editorial board, but I'm talking about peer review from other --

A. No, no. So when you submit an article for, a technical article for review, it goes to the editorial board, and the editorial board sends it out to peers for independent review. And then they either approve or require changes, and then it goes back to the editorial board, and then comments or concerns come back to you. So you submit it to the editorial board, and they get it out for review, and then it comes back.

Q. Okay. Do you know who reviewed it --

A. No.

Q. -- who that -- okay. Were any of, was that particular publication germane to the work you've done in this case?

A. No.

Q. Have you retained any of the drafts of these reports?

A. The, my publications?

Q. Yes.

A. No. They're available in the public. You can find them online.

Q. Sir, anything in any of your publications that you now want to change or revise?

A. Not that I'm aware of. It's been many, many years.

THE VIDEOGRAPHER: Seven minutes.

Q. Do you know if your publications have ever been cited?

A. You know, I had to prepare a CV for an Army program just a few weeks ago, and I was going back cataloging some of that, and I was surprised. There were a number of citations on some of the early work that I had done. Yes.

Q. Who cited it?

A. Other engineers in this space of fluid mechanics and turbulence research.

Q. Who?

A. Oh, I don't know by name. There were numerous citations. If you go to the citation index, it will point you to all of the citations.

Q. What citation index?

A. If you go online, you can go to Google and you can search for specific scholar articles. And then when you go to the links, they will show you what the

cross-reference citations are, how many people cite the documents, and then it links to those documents.

Q. Okay. I'm, I'm looking for documents that cite to you. How am I going to find those?

A. You can go to, search for my publications, and then in that you can, it will show you what the citations are.

Q. Okay. But you don't maintain copies of those?

A. No.

Q. All right.

A. No.

Q. Are you familiar with any publications expressing contrary views to your publications?

A. Not that I'm aware of.

Q. Has anyone requested the right to reprint your publication?

A. Not that I'm aware of.

Q. Did you ever receive any compensation for your publications?

A. No.

Q. Except perhaps the work you did at GM?

A. Yeah -- no. I, I mean my, I was an engineer. I was being paid for my work at General Motors. I was being paid as a researcher at the universities. You

know, the publications are just a criteria that you need to publish to be able to continue on in these spaces.

Q. Okay. Have you ever appeared as an expert in any cases where you did not wind up testifying?

A. No.

Q. Have you ever offered expert opinions to, in respect to any litigation before?

A. No. I don't know if the deposition that I did back in the late '90s, I don't know if that would be considered expert or not. I just simply don't know. They were asking me about my opinions on these various products.

Q. Okay.

A. So I don't, I don't know if that's expert or not.

Q. Have you been retained as an expert in this case?

A. Well, that's hard to say. I am, I was asked to, to do this deposition and to support, and in my severance package it indicates that I have to support them at, at their request. So I would guess that that's probably yes, but I don't really understand the technical delineation of that. I am doing it. I'm billing them for my time.

Q. Okay. Who contacted you to do this work?

A. **You did.**
Q. I asked you to do this work?
A. **No, no, no. You sent me a subpoena.**
Q. Yes. That's for your deposition.
A. **Right.**
Q. I'm talking about the work that you're doing on the case.
A. **Oh, the work that I'm doing on the case has strictly been to review and kind of understand what's happening and provide, I provided some simulation work about nine months ago, and the file formats were corrupt. They couldn't read the file formats, so I reran those and recreated the files for them. So I would say it's just that work, and I'm being paid by Industrial Heat as a consultant on an hourly basis.**
Q. When did you send them the non-corrupt files?
A. **I sent them files, I don't know, a week ago, but it turns out that those files were also corrupt. And so yesterday I went through and tried to figure out why the -- it was a video encoder problem. So yesterday I went through and re-created the, the files and tested them yet again and then made sure that they could test them and they could see them, and in addition to that I took screen captures of it.**
Q. Is there any reason why we would not have

been produced those files to your knowledge?
A. **I'm sorry. Say that again.**
Q. Do you have any reason to your knowledge why we would not have been produced those tests or files?
MR. LOMAX: Objection to the form of the question on, on the basis of any conversations you've had with counsel.
A. **I don't know who produces them. I just provided them to the attorneys.**
Q. Okay. So they've had them for some time?
A. **24 hours --**
Q. Well, but --
A. **Less than 24 hours.**
Q. But they had some version that was corrupted --
A. **Yeah, they were --**
Q. -- before?
A. **Yeah, the file was corrupted, yeah. And when they went to look at them and to produce them, I think it was a problem, and then they got back to me and I tried to --**
MR. LOMAX: That's --
A. **Anyway.**
Q. So --
A. **Okay.**

MR. ANNESSER: He can continue.
MR. LOMAX: Not if he's talking about communications with counsel.
MR. ANNESSER: He did not speak of communications with counsel.
MR. LOMAX: But if he is --
MR. ANNESSER: All right. So --
MR. LOMAX: -- I'm asking him not to.
A. Okay.
Q. Okay. Sir, did you ever show anyone at Industrial Heat these tests or modules or simulations that you've done?
A. Yes.
Q. When?
A. The first time that I really had enough time to kind of run them and look at them and kind of digest them, probably August or September of 2016.
Q. Okay. So Industrial Heat had them at that point in time?
A. They had, they had versions of them, yes.
Q. Okay. Any reason why they would not have produced them to us to your knowledge?
A. I, I don't know.
Q. Okay. What is your understanding of the assignment that you have been given in this case? What,

what have they asked you to do?

A. **To --**

MR. LOMAX: Objection.

A. **To be deposed.**

MR. LOMAX: When, I'm sorry. When you say they?

Q. Industrial Heat or its representatives or, for that matter, counsel if they're the ones that have tasked you in this case.

A. **Yeah, so nobody's, interestingly enough after I, after the company closed down and I left, I probably had a few communications, maybe a very minimal number of communications in November and December. In January I think I was getting a few questions here and there. I think a total number of hours was maybe on the order of eight or ten hours. And then this month, to get all this data ready to, for the deposition and to understand the deposition and to actually sit in to listen on a deposition, it's been more hours, but interestingly enough nobody from Industrial Heat has really given me any direction on that. It's just, hey --**

Q. Has --

A. **-- can you do it.**

Q. Have they asked you to opine to any matters in this case?

A. No, they have not.

Q. Okay. Have you formed any opinions in this case?

A. Yes. Yes.

Q. But nobody asked you to do that?

MR. LOMAX: Objection. Again, this is, you're asking him about some communications --

MR. ANNESSER: Mr. Lomax, no, no. If he's been engaged as an expert to testify in this case, I'm entitled to know what he's been asked to do.

MR. LOMAX: I understand. I'm simply trying to prevent disclosures of privileged information.

MR. ANNESSER: Well, he's allowed to testify to this. So this is not privileged information.

A. Can, can you repeat the question?

Q. Have you been asked to do any work in this matter, prepare any opinions in this matter by anyone?

A. Yes.

Q. Who?

A. Counsel.

Q. Okay. And what opinions were you asked to prepare? What was your task given to you by counsel?

A. So I was asked to review the data from before and to provide information on the flow meter analysis that we had conducted at Industrial Heat, number one, on

the simulations we had conducted at Industrial Heat in August, September. And I don't know. Those are probably the two major areas.

Q. When did you do a flow meter analysis?

A. When we came --

MR. LOMAX: Objection, again.

MR. ANNESSER: What's your objection?

MR. LOMAX: It's attorney-client communications --

MR. ANNESSER: When he did --

MR. LOMAX: -- attorney work product.

MR. ANNESSER: -- a flow meter analysis?

MR. LOMAX: You're getting into issues that involve his work with the attorneys in the case.

BY MR. ANNESSER:

Q. Okay. When --

A. We did that, we did the flow meter analysis for counsel.

Q. When did you do that analysis?

A. We bought four of the identical flow meters in 2016 I would say, just after the testing, but it took forever to get them here because they were coming from Poland. And then we did testing I would say through the summer and into the fall.

Q. The Summer of 2000 --

A. '16.
Q. -- '16?
A. And into the fall.
MR. ANNESSER: All right.
THE VIDEOGRAPHER: We're off the record at 1:15 p.m.
(Recess taken 1:15 p.m. to 2:08 p.m.)
THE VIDEOGRAPHER: We are back on the record at 2:08 p.m.
MR. ANNESSER: Sir, I remind you that you're still under oath.
THE VIDEOGRAPHER: John, counsel, mic up for me.
BY MR. ANNESSER:
Q. Helps if I put the mic on. I remind you you're still under oath. During the lunch break did you speak to anyone, speak with anyone regarding the subject matter of your time today?
A. Yes.
Q. Who did you speak with?
A. Counsel.
Q. And give him a moment to respond, because he is certainly going to object. What did you speak about?
MR. LOMAX: Objection. I instruct you not to answer about any, the discussions with counsel.

Q. Are you going to follow his instruction?
A. I am going to follow his instruction.
Q. Okay. Now, before we left for lunch we were discussing your testing of flow meters.
A. Yes.
Q. And you said it, it spanned in 2016 between the spring and the fall?
A. Yeah. We ordered devices in the spring once we got back. It took a long time to get them in, and then we started testing I think in summer into the fall.
Q. How did you test them?
A. We emulated the slope and the reach of the configuration that we saw in the plant. And we, we then took the flow meter, put it into a system. We put a, a viewing tube in it so we could see the flow. And, and then flowed water at fixed rates through a pumping system using another separate flow meter through the system and collected data for one to two hours at a time.
Q. How many tests did you do?
A. I would guess we did, I don't know, 12 or 14 tests.
Q. On each one of the flow meters?
A. No. We tested I believe two of the four that we bought.

Q. What type of flow meter did you use to measure the amount going into this test?

A. We bought a calibrated flow meter from a, a company.

Q. What type?

A. I would have to look at the model number. I don't have the data.

Q. Do you know the manufacturer?

A. I do not. Not off the top of my head.

Q. Did you have, before you began doing that testing did you have any preconceived beliefs regarding the proprietary of Dr. Penon's report?

A. The, I'm sorry, could you explain? The proprietary?

Q. The propriety. Whether his report was accurate, proper.

A. Yeah. I, I had reservations about the, the use, the instrumentation that was used.

Q. You had reservations or you had formed an opinion at that point in time?

A. I was, yeah, I had formed an opinion about the flow meter based on the numbers that were presented in the final report.

Q. At what time?

A. After I saw the final report. Probably even

before I saw the final report after the information came here.

Q. Now, the reports you, you referred to Exhibit --

A. Exhibit --

Q. -- Number 8?

A. Yes.

Q. Those reports had been provided to Industrial Heat before. He was just sending them to you again?

A. May, may very well have been.

Q. Okay. Did you ever see them before that time?

A. I don't know which of these. I've certainly seen parts of these. Yeah, I don't know if I've seen them all. I may have seen them all. I may have only seen a subset of them.

Q. And I'm sorry, sir. The date of that e-mail was?

A. The e-mail from Fabio Penon was February 23rd.

Q. When did you formulate an opinion as to the accuracy of the Penon reports?

A. I formulated an opinion about the accuracy of the flow meter on the 16th or, I'm sorry, not the 16th. The 17th of February, the second day of testing when we

were at the airport.

Q. You formed an opinion right there on the spot?

A. Yeah. I looked, I, I was surprised by the flow meter itself. And so we took pictures of the flow meter and its certification label.

Q. Sure.

A. And when we went to the airport, I looked it up and I downloaded the, the data sheet from the manufacturer. And I looked at it, and it sure enough said that the minimum flow rate was 1.6 meters cubed per hour. And I was, did the math, and I was like, you know, all these measurements are below the minimum operating flow rate of the meter. So I was concerned at that point and saying this is a problem.

Q. Well, there's a difference between being concerned and forming an opinion that the entire test was bogus. Would you agree?

A. Yeah, I didn't say the entire test was bogus. I was specifically talking about the, the, the validity of the flow meter.

Q. Do you believe the entire test was bogus?

A. How do you mean -- what does bogus mean?

Q. I don't know. Did you think the whole thing was either fraudulent or so poorly done that it couldn't possibly give an accurate result?

A. **I think that the, the test, inclusive of Industrial Heat and Leonardo Corporation, was so poorly designed that you couldn't get an accurate result from it, yes.**

Q. Okay. Did you blame that on one side or another?

A. **At that time I was probably frustrated and concerned about Leonardo Corporation's position. I was very frustrated that we couldn't see the full system when I was at the factory, but as I went through this, I feel like all parties are complicit in this mess. And I've said that, too.**

Q. Because of the test plan?

A. **Because of the overall construction of the system and how it was put together and how it was instrumented and how it was operated, and the lack of my ability to actually get in there and see things.**

Q. Okay. Now, so as of March 2016 you had not done the water flow analysis yet to see if there would actually be a higher error rate with a decreased water flow?

A. **Well, we did not do flow analysis to determine a higher error rate or not. What we did was we looked at the flow meter from what happens when you**

operate it outside of a valid regime, right. If you're operating outside of the defined operating parameters, then we just wanted to find out what would be happening. Why would, why did we see the corrosion line inside the flow meter? Why did these things exist? I'm trying to understand what the test was telling us.

Q. Okay. And we'll get into that in a little bit more detail, but at that time you had already determined that the report was, Penon's report was completely bogus?

A. At which, which time?

Q. March 29, 2016, prior to undertaking the water flow meter analysis?

A. Yeah. I, well, I had res, I would say I had strong reservations about the validity of the flow meter data.

Q. In fact, you called it bogus?

A. Yeah, possibly.

(Whereupon, Exhibit 9 was marked for identification.)

Q. You did. I'm going to show you a document we'll mark as Exhibit 9, bates stamped IH00087309. You know what, this appears to be different than the one that I've got here. Hold on. Let me take that back.

A. Oh, I'm sorry.

Q. I may have marked the wrong document. No, strangely you've got the right one. Just have one that's wrong. Heads will roll at the office.

Sir, looking at the e-mail chain here on the first page, this is from Brian McLaughlin. Who is that?

A. I believe he was a PR company relationship person.

Q. And he sends you an e-mail that you must have been copied on. He says, "Thanks, Dewey. Do we actually have the report?" Referring to the Penon final report?

A. I, I don't know, down below. I presume -- do we have the report, so that was from -- was I included on this e-mail?

Q. Well, presumptively. You responded to it.

A. Yes. Yeah, maybe.

Q. And your response to his question, "Do we actually have the report," you say, "Yes, and it is completely bogus" --

A. Yes.

Q. -- "Joe."

A. Uh-huh.

Q. So at that point in time you had determined it was bogus irrespective of any testing you had done or not done at that point?

A. Yes. So at that time I felt very strongly that the flow meter data was bogus.

Q. Now, don't you believe, sir, that when you're doing testing, specifically in an expert capacity, that you should remain impartial and rely solely on what the tests show as opposed to your emotions?

A. Well, I was actually looking at the results of the test. So I was given a set of results and looked at that. And there were, there's really a major concern in that the flow meter data was astoundingly inconsistent. Over many, many days, had the same exact value.

And when you read the instruction manual from the manufacturer, there's actually a series of separate gauges that can give you tenths, hundredths, and thousandths of the volume. And so whoever was making the flow meter measurements was just looking at the primary odometer type reading, the tumbler. And they were not looking at the other parts to provide a more detailed and more accurate data input.

So my concern was it's bogus because there was an incomplete -- if somebody had actually measured and looked at that, we would have been able, you probably would have seen differentiation day to day, which wasn't done, but it was still invalid because it

was below the minimum operating threshold for the flow meter.

Q. Let's, let's talk about that for a moment. What unit of measurement did the flow meter register?

A. Meters cubed per hour. No, actually that's not true. The flow meter was an odometer type meter, so what you had to do was you had to look at the number of meter cubed that it, it produced. And then if you looked at the subdials, you could see the fractional component of that.

So what you would do is you would take a measurement on, let's say the beginning of the day at the same time. I think the measurements that Penon produced said that the measurements were made at like 10:30 p.m. I don't have the report in front of me, but let's say nominally 10:30 p.m. So day over day somebody went back and made a measurement. They looked at those numbers, documented those numbers, and provided them to Mr. Penon.

Q. Okay. Now, cubic meters, okay, that's a, that's a volume, correct?

A. It is, yes.

Q. Okay. How many kilograms are there in a cubic meter?

A. It depends on the density, the temperature of

the fluid, but in general people estimate that one kilogram of water is one liter. So a cubic meter would have 1,000 kilograms.

Q. Okay. How many decimal points did the meter go to?

A. The, the actual meter itself went to 10 --

Q. On what you can read on the display on the meter. Okay.

A. Well, the upper meter reads meters cubed, but it also has three subdials where you look through the, the hole and you rotate it when you read it, and it gives you tenths, hundredths, and thousandths.

Q. Okay. But when you're looking at just the dial?

A. Uh-huh. If you, as I said, it's meters cubed on the primary, but if you're reading the instrument --

Q. Are there any decimal points though? I mean when I look at the meters cubed, does it say 34 meters cubed or does it say 34.2 meters cubed?

A. No. When you use this type of meter, what you do is you look at the meters cubed. And if you're not using the digital interface, then you can remove the, the magnetic shield and actually see all three dials, but if you are using it -- what you do is you look at the meters cubed, and then you rotate that and

you see tenths, hundredths, and thousandths. So if it took you one second to read the three, it would take you five seconds to properly read it with tenths, hundredths, and thousandths as well.

Q. Okay. Is it possible that he read it by the number of cubic meters per day?

MR. LOMAX: Objection to the form of the question.

Q. Mr. Penon?

A. Who? Who? I'm sorry.

Q. Mr. Penon.

A. Read the?

Q. Or, or that it was read on a number of cubic meters per day?

A. I, I, my understanding is that Dr. Penon was only there on a few occasions.

Q. Okay.

A. So I don't know who read it.

Q. So you don't know if Dr. Penon rounded down, rounded up?

A. I would think if it was a, a robust test, you would actually use the instrument as it's designed to be used, so you would look at the primary meter and you would look at the tenths, hundredths, and thousandths.

Q. That's how you would do it?

A. Well, I think any competent engineer would do that, yes.

Q. But it's -- strike that.

Do you have any information that there was not that much water flowing through? And I want to, I'm going to ask you to differentiate between your opinion and fact. Okay. Certainly, if the amount of water reported by Dr. Penon did flow through, then it would register that on, properly on the, the water flow sensor or the meter?

A. Okay.

Q. Okay. And I understand you have an opinion that you could also achieve that reading with a lower number, with a lower amount of water?

A. My opinion is that you could actually achieve a wide variety of different readings depending upon the slope and the reach of the pipe. So if I'm looking at that, my opinion is that the manufacturer sets the limit for the minimum allowable flow rate, and we were below that. And so, therefore, the measurements are invalid.

Q. Okay. When you fall below that rate what, what margin of error do you have?

A. There is no defined margin of error for when you fall below that because the, the system, if, depending upon the slope and the reach of the pipe, you

can vary that reading. So depending upon how the system is exactly set up, it would give you a different value.

Q. What was the slope at the Doral facility?

A. So when we went back to measure it, while we were there in February of 2000 -- February 16th and 17th of 2016 --

Q. I'm, I'm going to ask you to wait for a second.

A. Okay.

Q. I just asked a simple question. What was the slope at the E-Cat facility?

A. I would have to look in my report to find out.

Q. Do you have your report with you?

A. I do not.

Q. Did you prepare a report?

A. Yeah. I think there were, there was a report that said this is what the slope and the reach was.

Q. When did you prepare that?

A. I prepared one at the end of our testing in probably October, and then I revised it to make it clearer about two weeks ago for my counsel.

MR. ANNESSER: Is there a reason we haven't been provided a copy of his report?

MR. LOMAX: You haven't?

MR. ANNESSER: No.

MR. LOMAX: You never received a report?

MR. ANNESSER: We, we received an expert disclosure. We've never gotten a copy of his report.

MR. LOMAX: Oh. We can discuss.

MR. ANNESSER: I want to know why we haven't gotten a copy of his report and I'm taking his deposition today.

MR. LOMAX: You want to talk to me about that, or do you want to --

MR. ANNESSER: Yeah, I want an answer.

MR. LOMAX: Am I on the -- I'm not sure how this is supposed to work procedurally. You want to ask me questions about his report?

MR. ANNESSER: Well, I would like to know why I am, why I am now deposing a witness who has prepared a report that I have never seen.

MR. LOMAX: It wasn't prepared for you. There, there are different things that have been prepared, and I've tried to draw this line.

Q. Okay. So that was prepared solely for counsel, not for --

A. I prepared that for counsel on their request.

MR. ANNESSER: So you're not planning on

using that report in this case?

MR. LOMAX: I'm, he --

MR. ANNESSER: Do you plan on using that report in this case? Do you plan on showing it to a jury?

MR. LOMAX: If we do, we will provide it to you.

MR. ANNESSER: No, that's --

MR. LOMAX: At this point --

MR. ANNESSER: -- that's unacceptable.

MR. LOMAX: At this point I am not prepared to talk about what report of his we're going to provide and what version it's going to be in. If we do, we'll provide it to you.

MR. ANNESSER: So --

MR. LOMAX: As of right now, what he's talking about is things that he did in anticipation of litigation at our request. And I will again make my objection to you asking him more things about that.

MR. ANNESSER: Well, if you plan on introducing a report prepared by him without having provided it to us before his deposition with plenty of time, then we're going to have other issues before the court.

BY MR. ANNESSER:
Q. Sir, sitting here today you don't know what the slope was?
A. I do not.
Q. Okay.
A. I can't recall.
Q. Now, did you do any testing with a different slope?
A. We did testing with multiple slopes, yes.
Q. What slopes did you test?
A. They're in the report that I prepared for counsel.
Q. You can't tell me what they are today?
A. It was a few inches difference, just very subtle difference. I don't know what the numbers are off the top of my head.
Q. Okay. What was the margin of error when you put the water flow as purported, as reported by Mr. Penon through at the slope that you say was measured at the Doral facility?
A. A flow rate of approximately five liters per minute corresponded to the flow rate that Mr. Penon reported in his report.
Q. Five meters per minute?
A. Five liters.

Q. Liters.
A. I'm sorry, liters, yes.
Q. Okay. But you don't know what that slope is today?
A. I, I don't know off the top of my head.
Q. And you say approximately five. Do you know exactly?
A. No, I don't. I don't have that report in front of me.
Q. So at five liters per minute you're talking generally .3 cubic meters per hour?
A. I would have to do the arithmetic. .3? No, no, that's not, that seems too low.
Q. Well, five liters a minute would be 300 liters per hour, right?
A. Do the arithmetic for you.
Q. 5, 5 times 60, 300. That's 300 liters per hour?
MR. LOMAX: This is an exhibit.
A. Oh, sorry about that. Okay.
Q. You need a scratch piece of paper?
A. I can just do it on this.
Q. There you go.
A. Okay. Okay. 300 liters per hour.
Q. Okay. So 300 liters per hour. And you say

it gets the same result as what Engineer Penon was reading?

A. Yes, but I will say that my purpose of doing this test was to understand how the flow meter operated when the pipe was less than full. The manufacturer states in their instructions do not use this meter with the pipe less than full. So the valid, the valid point is 1.6 meters cubed per hour, is the minimum that the device works at. And the record or all of the data that I have seen was, I think almost every single day was below that number of 1.6.

Q. See, this doesn't make sense to me, and I'm, I want you to explain it.

A. Okay.

Q. So how does this meter work? There's a turbine inside, correct?

A. There are two static stators that are flow conditioning. There's a turbine that turns, and that turbine turns and it creates a pulse on a magnetic interface, and it turns the little gear mechanism to run the meter. And so you can see the number of meters cubed by if the pipe is full and that you're above the minimum threshold; it will give you an accurate measurement to whatever the type certification is. If the pipe is not full, it will still turn the meter. In

fact, you can blow in a meter with just your breath and have it turn. And so, and that would be no flow. It would just be air flowing across it.

Q. Does this turbine turn in two directions?

A. Yes.

Q. Okay. So it, it can, it can turn either clockwise or counterclockwise?

A. Depending which direction the flow was going, yeah, but it would be, in a, in a sloped pipe like that, it should only flow in one direction.

Q. In a sloped pipe it should flow in one direction. Is that --

A. That's correct.

Q. -- clockwise or counterclockwise if you're looking at the --

A. I would have to see the exact configuration to, to say which way and which angle the veins are sloped.

Q. How did you test it? How did you test the meter?

A. As I said, we put in a pipe system, it, the best we could emulate just to understand how, how this device would work. We put in a system. We had a clear section of pipe. We flowed water through at known rates, and we allowed it to run for a long period of

time. We measured the, the, the numeric number, the primary numeric number. We also had an electrical interface on it so we could read the number of pulses electronically. And then we were able to, to look at the comparison between the flow rate that we had from our calibrated sensor and this device to see what the difference was.

Q. Did you ever try running, was it I guess 1.6 cubic meters of water within an hour?

A. Oh, yeah. We tested a whole wide range, because you could achieve a number much, much larger with just a modest amount of water in the pipe. So if the -- so there are two principal key parameters of the system. The first one is the pipe has to be full, and the second one is you need to be above the threshold. So if the pipe is not full, then the, the numbers are bogus. You can get a whole wide range of numbers. If --

Q. Consistently?

A. Yeah. It, at a fixed slope and a fixed reach. If the slope changes, you get a different set of numbers because it's an undefined state. That's why in the operator's manual and the instruction manual for this device they say you have to make sure that the pipe is full and you have to make sure that you're above the

minimum threshold. And then the type certification, they actually define a region from 1.6 meters per, meters cubed per hour to 2.5 meters cubed per hour where the, where it's called transitional flow, where they describe it as a higher error. This particular meter was really designed to operate around 40 meters cubed per hour, not at this very low flow rate.

Q. The very low flow rate being what?

A. Less than 1.6 meters cubed per hour.

Q. So this, this device should be operating at no less than 40 meters --

A. No, no, no. What I said was the device is designed to operate between 1.6 and I believe the upper limit is 80 meters cubed per hour, but in the actual instruction manual for the device they give you design criteria. And what they say is use the jet flow value, and they define that in the, in the design, in the manual. And they recommend that the operational range be 0.3 to 0.4 of this jet flow rate. That's the optimal range for this device. And so in the instructions they, they indicate to size the, the flow rate, the flow meter based upon these values.

Q. So this particular meter, the one that was used for the test --

A. Yes.

Q. -- what was the range in which it should operate?

A. 1.6 meters cubed per hour to, I don't recall if the upper limit was 80 or 60. It was, it was in that range.

Q. So 1.6 is 38.4 cubic meters per day?

A. Yeah, could be. Yeah. That seems like the arithmetic.

Q. And the reported flow rate was what?

A. Reported flow rates went from I believe about 24 to about 37. There may have even been a few days that were up into 38.

Q. Okay. So it would have been accurate on those days where it was up into 38?

A. Only if the pipe was full. So this, this is the -- you know, there are multiple criteria on using these types of devices. So the pipe has to be full, and it has to be above the minimum threshold.

Can I get a water? Thanks.

Q. Yes, sir. You don't know what the slope was, but the slope between the wall and where the meter was located, how much distance was there; do you know?

A. I don't recall off the top of my head.

Q. Okay.

MR. NUÑEZ: Hi, this is Rudy Nuñez rejoining the deposition. I'll go back on mute. Thank you.

Q. Okay. You don't know sitting here today?

A. I do not.

Q. Okay. Do you know if it was greater than ten inches?

A. I believe it was less than ten inches. So we had to, we had to go back to the facility. We did the best we could in the time we had on February 16th and 17th. We measured what we could, but we didn't have the right instrumentation or tools. So at some point later, and I don't remember if it was in March, at some point we went back and we wanted to measure the exact location of these, the pipes and to get the reach of the pipes.

When we went back all the pipes had been removed, so all we could do is estimate the location based on the pictures we had taken, and we could measure the entrance point into the container and the hole through the wall and the reach to that. So we actually measured all of that. I don't remember if it was March. Maybe it was in April. I don't even remember.

Q. Okay. So you were able, you were able to get that information, but mind you, the --

A. Well, estimates of it. Because we, the pipe had been removed, so all we could do is work from the holes and --

Q. Well --

A. -- the pictures that we had.

Q. The meter had been removed by Dr. Penon, had it not?

A. The meter was removed, yeah, and, but the pipes were left in position when we were there and the fixturing that was holding the meter in place.

Q. Okay.

A. And it was removed between those two, the two visits.

Q. Okay. Now, do you know if the, if the pipe going into the plant after the flow meter, okay, if you have --

A. Pipe going into the plant, okay.

Q. -- after the flow meter, was that higher or lower than the flow meter?

A. I believe it was lower.

Q. You believe, okay.

A. I do.

Q. What gives you that belief?

A. My recollection of the configuration.

Q. Okay. The pipe was lower than the flow meter itself?

A. Which one is the flow meter --

Q. Okay.

A. -- in the visual? So --
Q. You know what, we're going to draw it here.
A. Yeah, good.
Q. And I'm going to, I'm going to apologize for my drawing because it is awful. So if we have a pipe with a flow meter between -- I'll mark that FM. Sorry. Again my, my drawing is awful. This is the pipe going to JM. This is the pipe going to the plant.
A. Okay.
Q. Okay. Follow me so far?
A. Yeah.
Q. Okay. Was the flow meter higher or lower than where the pipe going to the plant entered the plant itself?
A. I believe that the flow meter was almost at the same level, slightly higher than this.
Q. What --
A. To the best of our ability.
Q. What gives you that belief?
A. The pictures that we had taken from, at the plant on that day.
Q. Okay. Do, did you rely upon those photos in doing your report?
A. We had to, we had to estimate because we didn't have the measurements.

Q. Could it have been lower?
A. Could the?
Q. The flow meter have been lower than --
A. Yeah.
Q. -- the pipe entrance?
A. Possibly, yeah.
Q. Okay. But you don't know one way or another? You're speculating?
A. Yeah, just working from memory, yes. I don't know.
Q. Okay.
A. Should also note that the flow meter did not have valves on either side as the manufacturer recommends.
Q. What's the purpose of the valves?
A. To allow you to control the, the flow into the meter, to do repairs and cleaning as necessary as well as to ensure that there is no air in the flow line.
Q. The lack of a valve isn't going to affect the operation of the meter, is it, other than the fact --
A. According to --
Q. -- that you can't close it off?
A. According to the manufacturer, it is recommended that they have valves on both side of the flow meter.

Q. For maintenance?

A. No. To ensure that when you turn it on, you don't get an air bubble stuck on the inside of the meter, and also there's a risk of damaging the flow meter if you have jet flow that comes in too quickly in higher pressure, higher flow applications.

Q. Do you have any information that any of that occurred --

A. No.

Q. -- at the Doral facility?

A. No.

Q. Okay. Did the flow meter have flanges?

A. Yes.

Q. Isn't it true, sir, that as of July 22, 2015, you believe that Dr. Rossi and Leonardo Corporation were muddying the waters with respect to being able to replicate and reproduce the E-Cat devices?

A. What do you mean by muddying the waters?

Q. I'm using your word, sir.

A. Could you put it in context of what it --

Q. Sure. Why don't I put it in front of you --

A. Okay.

Q. -- and give you the e-mail in which you state it?

A. Okay.

Q. I'll mark it as Exhibit 10.
(Whereupon, Exhibit 10 was marked for identification.)
Q. And this document is IH-00088933. Take a moment to review if you need.
A. Uh-huh. July 17th.
So what is your question?
Q. July 22, 2015, this is about a week or so after Dr. Rossi indicated you could not come down to the plant; is that correct, give or take --
A. Yes.
Q. -- a week?
A. Yeah, about that.
Q. And you say, "This is a very encouraging note. Leonardo Corp does muddy waters. I hope that can be brought into a viable path soon." What did you mean?
A. So if you look below, there is this researcher in India, Srini Srinivasan, who has been a researcher in low-energy nuclear reactions for a long time. And in India the programs had been terminated. A lot of the research had been terminated, although they had claimed some success in some of their experiments. And this, this person was planning on coming over to the United States and have some meetings, and he was trying to reinstitute a research program in India.

And specifically, the concern was that there was a lot of discussion about, you know, what's working, what's not working, who is trying to replicate what. And so Mr., or Dr. Srinivasan said, hey, he was trying to initiate a program and he wanted to be a research partner of Industrial Heat. And so my comment was that, hey, it was encouraging that the Indian government might consider another research program, because we were all very excited about the potential for low-energy nuclear reactions if we could reproduce them.

However, the Leonardo Corporation with the, all of the efforts that were going on there and the replication efforts that were going on in, I think in the Ukrain, and different efforts that were going on in China, it just muddied the waters. There was a concern on their part. And so our goal was to figure out how do we make this viable, because ideally we would be successful in making this work. So that was the context of this.

Q. Okay. And then Mr. Weaver sends you an e-mail July 22nd, says, "Agreed. There's a high probability that R" -- is that Rossi?

A. I presume.

Q. -- "is going to screw up, screw up his deal."

A. Yeah, I don't know what Dewey was saying

here, but.

Q. Did you ask him what he was saying?

A. No.

Q. No, you didn't.

A. No.

Q. Okay.

A. I get 100 e-mails a day, particularly from Dewey, so.

Q. Okay. Then it goes on to say "TD". Who would that be?

A. I believe that would be Tom Darden.

Q. Okay. So, "Tom Darden may try and change the status quo and lower the pressure on Rossi with a more simplified, lower profile plan B."

A. Yes.

Q. So they're going to bring the, bring the pressure down on Rossi --

A. No, I don't think that was --

Q. -- to change the status quo?

A. That is not what the, I, my belief is at this point -- again I'll go back. Tom and John both insisted that if any possibility that this was working, they wanted us to be able to validate it, verify it, and reproduce it and, because that was the gateway to follow-on development activities.

So what Tom, my recollection was that Tom said, well, why don't we just simplify this and do a much smaller test, get together with Mr. Rossi, come up with something that we can all simply test, and do that test so we could take that back and move forward with it, if we could produce it and validate it, verify it.

So I believe at this point, and I wasn't directly involved, but what was, what was suggested to me was that potentially we could agree to do a smaller scale, simplified test. And, and I think that the general conclusion from everybody was if we got any level of reliable performance, there would be a path forward without a doubt.

Q. Sir, before the lunch break I started asking you about what you were asked to do in this case specifically. What opinions were you asked to render?

A. As I described before, the, specifically related to the validity of the sensor measurements, the flow meters, pressure. I was asked to look at what would happen, simulations of the facility, how hot would it be in the facility. There were probably a couple other things, but I don't recall off the top of my head without that information in front of me.

Q. You don't know sitting here today what your opinions were?

A. No. I said I don't know what I was asked to offer an opinion on.

Q. Do you have any idea what you're expected to testify to in this matter?

A. Actually I, I have not engaged, other than the very minor amount of work I've done in the last week in preparation for this, I have not engaged much on this at this point.

Q. Okay. I'm going to show you a document that we'll mark as Exhibit 11.

A. Okay.

(Whereupon, Exhibit 11 was marked for identification.)

A. Uh-huh.

Q. Have you seen this before, sir?

A. Yes, I have.

Q. Did you prepare this document?

A. I, I approved what was prepared in this document.

Q. There is a section on Page 1 that says summary of opinions?

A. Uh-huh.

Q. Have you seen that before? Have you --

A. I have, yes.

Q. -- reviewed that? And are those your

opinions, sir?

A. **Yes, yes.**

Q. Are there --

A. **I did a comparison of the Florida Power and Light company data to the data provided by Mr. Fabiani and Mr. Penon.**

Q. Okay. Are there any other opinions other than those set forth herein that you plan on opining to?

A. **In this whole document?**

Q. Or testifying to? Yes.

A. **So let me just review. So Florida Power and Light power compared to the data provided by Penon and Fabiani, the relationship between power and coefficient of performance, heat simulations, and water flow. Yeah, those are the areas that I do plan on offering opinions.**

Q. Okay. I didn't ask areas. I asked about the opinions specifically.

A. **Oh, I'm sorry.**

Q. Are there any additional opinions that are not set forth in here --

A. **Not --**

Q. -- that you plan on offering?

A. **Not that I'm aware of at this time.**

Q. Okay. Then we're going to go through these.

A. **Okay.**

Q. Who drafted this, sir?
A. Counsel.
Q. Counsel. Now, when you received it, had they drafted it with your opinion section already completed, or did they --
A. I --
Q. -- ask you to prepare that and then send it to them?
MR. LOMAX: Objection.
Q. Okay. I'm not going to ask you what they asked you. Did you prepare that and send it to them, or was it drafted by counsel?
A. I provided input to them in the form of the data that I provided to them.
THE VIDEOGRAPHER: Counsel, I hate to do this, but I need to go off the record briefly, change this out, and then we'll go back on.
MR. ANNESSER: Sure.
THE VIDEOGRAPHER: Apologize. We're off the record at 2:48 p.m.
(Recess taken 2:48 p.m. to 2:50 p.m.)
THE VIDEOGRAPHER: We're back on the record at 2:50 p.m.
BY MR. ANNESSER:
Q. Okay. Sir, with respect to your first

opinion you state, "Mr. Murray will describe" -- I'm sorry. Your disclosure states, "Mr. Murray will describe how the data generated by Fabio Penon and Fulvio Fabiani pertaining to the power absorbed during the testing of the E-Cat plant at the address of Doral location, JMP" -- is that address of Doral location, was that, why is that in all caps?

A. I don't know.

Q. Was that supposed to actually be the address of the Doral location?

A. Potentially.

Q. Okay. But you didn't draft this. Okay.

-- "is at odds with the amount of power used at the Doral location as demonstrated by Florida Power and Light, FP&L records."

A. Uh-huh.

Q. What did you do to come to that conclusion?

A. We received the daily power or energy records from Florida Power and Light via subpoena for periods of time before the plant was installed, the period of time when the plant was operating, and periods of time after the plant was installed. And what we did was we, we compared that daily energy level to the daily energy levels that were provided by Fabio Penon and Fulvio Fabiani.

Q. How did you compare it?

A. We used a analytic tool to look at the data and to plot it to make a comparison between them.

Q. What analytic tool did you use?

A. We used a series of tools called Python, which is a programming language, with iPython -- it's now called Jupiter Notebook, but it used to be called iPython Notebook. We used NumPy, which is a numerical tool kit; SciPy, which is a scientific library; and something called Pandas, which is a data analytics tool to be able to compare data. And we plotted that --

Q. What --

A. -- using Matplotlib to make comparisons between the various data sets.

Q. So, so what exactly do these program do?

A. Well, you read the data in. You formulate it so you can get an exact --

Q. Hold on one second. How do you read the data in?

A. So in that, there's a Pandas library that allows you to read in a comma-separated file or an Excel file, other types of files. We read that in and we then com -- then we can directly compare date-matched times and dates and plot the data.

Q. Okay. Let's talk about that for a moment.

It reads Excel files. How did you get the data from the Penon report into that system?

A. **We typed it in by hand.**

Q. Who did?

A. **I typed in some of it. There was -- oh, did you say Penon?**

Q. Penon.

A. **Penon. I typed it in. I had some, some of the younger engineers type it in, and then we had a separate person cross-check it to make sure it all matched.**

Q. Who was the younger engineer and who cross-checked it?

A. **So Jason Kemp was the person who cross-checked it, and James Hartanto was the young person who actually typed it in.**

Q. Is Mr. Hartanto an engineer?

A. **He is, he has a degree in I believe chemistry and applied math.**

Q. So the answer is no?

A. **No. Yes.**

Q. Okay. And James Kemp, is he an engineer?

A. **Jason Kemp?**

Q. I'm sorry, Jason.

A. **No, he's not.**

Q. Okay.

A. They were doing just data transcription.

Q. Who do they work for?

A. At that time they worked for Industrial Heat.

Q. Who do they work for now?

A. I think Jason Kemp took a job with Pike Electric, and I believe that James Hartanto is getting ready to go to graduate school.

Q. Okay. Now, the FP&L data, how was that in-put?

A. That data was received in a PDF file, and we converted all of that data using an OCR reader to, to, into a comma-separated file or Excel file. And then we actually had Jason and James go back and cross-reference and check it against the original documents.

Q. Do you know if there were any mistakes in those? Typos?

A. I don't know. I mean they went through and checked it and cross-checked it, and I went through and sampled a check as well.

Q. How much sampling did you do?

A. I would say hundreds of points. I mean I went through almost line by line to cross-check it, but it becomes very bleary-eyed when you're doing that. So then they did a every-single-line cross checking it to

the data that was provided under subpoena.

Q. So all of the input was done by Industrial Heat employees?

A. Yes.

Q. So you've got both of those in, and how did you compare them using these programs? Was there a complex analysis, or was it just plotting these out into a graph?

A. So first, well, there was also a third piece of data. That was the data provided by Fabio Penon. He provided that, that data in, again in March/April time frame he gave us files. I kind of described that earlier.

Q. Mr. Penon did?

A. I'm sorry. Fulvio Fabiani provided us files. And so we, we looked at that, that data. Fulvio Fabiani's data actually had two measurements for each day. He had a measurement at, I believe the numbers were 10:30 a.m. and 10:30 p.m. Mr. Penon's data -- I have to be careful, make sure these names are right -- Mr. Penon's data was actually only once per day. It was at I believe 10:30 p.m. each day. And the data from Florida Power and Light was each day at midnight.

So what we did is we went back and we cross-referenced it and made comparisons on a daily

basis and made, to make sure that we were comparing apples to apples. And then we plotted the data and took the differences between the various data sets and checked the integrity between Penon and Fabiani's data and then checked the comparisons against Florida Power and Light.

Q. Okay. So let's look at Exhibit A of Exhibit 11, which you should have in front of you.

A. Okay.

Q. Is that, sir, the comparison that you did?

A. This is part of the comparison, yes.

Q. Okay. I only see two lines here, one green and one red.

A. Underneath it you can see a few points where Mr. Fabiani -- I'm sorry. We gotta look at the colors here. It's hard to see at this scale. Mr. Fabiani's data diverges from Mr. Penon's data. You can see right about here, and you can see down here. So there were very little divergence between Mr. Fabiani and Mr. Penon's data. In fact, I would, I would argue they were the same exact data.

Q. Okay. The same exact?

A. Except for these points where they diverge. Because Mr. Fabiani's data, as I said, had two data points per day where Mr. Penon's data only had one.

Q. Okay.
A. And so they --
Q. So that would be consistent with the data points or the data being measured being accurate, correct?
A. It would certainly be consistent with the data being measured coming from the same device.
Q. Any reason to believe that either one of them have manipulated the results?
A. No.
Q. Okay. So the green line is FP&L?
A. Yes.
Q. All right.
A. Florida Power and Light, yes.
Q. And for the vast majority of this, the green line is higher than the red line?
A. That's correct.
Q. So the amount of power supplied by FP&L substantially exceeds the amount of power that was recorded going into this device?
A. Yes, yeah.
Q. Is that odd to you?
A. No. You would imagine that a facility like this, the actual reactor system would absorb some power, but you would imagine that there are also some, some

lights and the fan in the bathroom. There were a few air conditioners around there. There was an office in the front that I imagine would have heat and air conditioning. So you would expect that Florida Power and Light numbers would be higher than the numbers that Mr. Penon and Mr. Fabiani measured. That would be a reasonable expectation.

Q. Florida Power and Light's measurements, how were those taken?

A. They were taken with a smart meter located on the, on the building.

Q. What type of smart meter?

A. The smart meter that's approved by the State of Florida.

Q. You know it's approved by the State of Florida?

A. Yes.

Q. How?

A. I looked at the Florida Public Works Commission website to find out if these things were approved and how they were approved. And they indicate that for investor-owned utilities, that they have approval and then they give you a link to Florida Power and Light, and in Florida Power and Light's data they give the full description of how they implemented these

programs and what the options are for the programs.

Q. When was the FP&L device last calibrated?

A. I have no idea.

Q. Do you know if it's been three years?

A. No idea.

Q. Four years?

A. I have, still have no idea.

Q. Okay. So you, you have absolutely no information with respect to whether their data is accurate or not?

A. What I know is that they provided it under subpoena. They may or may not be accurate.

Q. Okay. So you don't have any reason to believe that we should rely on those results as opposed to the results of Mr. Penon or Mr. Fabiani; is that correct?

A. I disagree with that. I, I would say that we have to at least look at this and understand why, why would it be this way. And so my view is that if, if a company like Florida Power and Light provides data under subpoena, there would be an expectation that they would provide, would provide proper and accurate data, and it's a reasonable way to check the facility. We did this, I did this kind of anticipating that Florida Power and Light would always be higher than the measurements

that were made here.

Q. Okay. And, and the vast majority of the time here they are?

A. Yes.

Q. With very few exceptions, in fact. And one exception is between November and December 2015?

A. Yes.

Q. And during that period it, it appears that the power usage drops by the FP&L measurements, right?

A. The FP&L measurement drops, yes, below the measurements provided by Mr. Penon and Mr. Fabiani.

Q. Do you know why that would be?

A. I have no idea.

Q. Do you know if it's accurate? Do you know if, perhaps, there is a problem with the device, the measuring device?

A. I have no information other than the data that was provided in the subpoena by Florida Power and Light.

Q. Okay. So you have no reason to believe that that information is more accurate than the measurements taken by Penon and/or Fabiani, correct?

A. No, other than the fact that it's a Florida utility, and they are regulated. I would think that --

Q. Do regulated Florida utilities ever have device malfunctions?

A. **Oh, absolutely. Absolutely. In fact, I believe in this facility they actually replaced a smart meter at some point earlier in the year.**

Q. Why do you believe that?

A. **Because the registration number of the meter in the subpoenaed data changed.**

Q. When was that?

A. **I don't recall. It was earlier in the year. I would say sometime maybe in the May or June time frame.**

Q. Okay. Do you know if it was hooked up correctly when it was replaced?

A. **I do, I do not.**

Q. Okay. So what you've got here is just a comparison side by side of the two number sets. Is there anything scientific about that other than looking at it?

A. **It's, it's very alarming to see a drop. I mean in general when you see this, you see a very, very consistent amount of power being absorbed by the reactor system. And when the reactor system has a major drop like here in the, let's say between July and August you see a drop off, which I think corresponds to the data that says, hey, we had some, some reactors go offline,**

you see that drop. That makes sense. And then sometime in October they brought all of the units back online and the power goes up.

So all of the trends seem to be consistent except for this period of time when, in about from middle of November to the beginning of December where you have a power level absorbed into the building lower than the measured. So that would give -- to me, there are three potential explanations. Number one, Florida Power and Light could be wrong. Number two, the measurements made by Fabiani and Penon could be wrong. And number four or -- I'm sorry, number three, the data could have been manipulated. On either part, on either party.

Q. Do you have any evidence that the data has been manipulated --

A. No, I don't.

Q. -- by either one?

A. Not by Florida Power and Light or by Fabiani or Penon.

Q. Okay. So you have no evidence of manipulation. So what are you opining to specifically here?

A. Specifically, in this period it was, it was determined by Mr. Penon that the measurements, the

absorption of power was accurate and reflected what was happening in the reactors. But if, in fact, Florida Power and Light indicates that their data is valid in the data provided under subpoena, then it would be impossible for them to absorb more power than Florida Power and Light provided.

Q. Now, you keep saying data provided under subpoena, as if that makes it more accurate. It's the measuring equipment that makes it more accurate or not, correct?

A. Sure.

Q. Not whether it was voluntarily provided or under subpoena?

A. Uh-huh.

Q. Correct?

A. Yeah. My view is that if, if a, if a person is providing data under subpoena, they're going to probably provide the best possible data they have. We also know that Florida Power and Light has hourly measurements for this facility, and we have not received that data.

Q. Okay. But you don't know whether it was measured correctly or not at that point in time. All you can tell based on this is that there is a difference?

A. Yeah. I don't know whether or not any of these lines were measuring correctly at that time.

Q. Okay. So what I'm, what I'm trying to determine, because you're, you're giving an opinion as to this, is I can see this as well as you can. I can see this graph.

A. Right.

Q. I can see the, the lines where they drop below the Penon number and, which would indicate that if the FP&L measurements was right, it was supplying less power than the power going into the unit. Okay. But other than that, is there anything scientific that we had to apply, any methodology to apply to, to create this graph?

A. This is just a summary graph. And I think there's, might be another plot in this --

Q. There is. And we'll --

A. -- Exhibit B.

Q. And we'll get to that one.

A. Yeah, so there were a series of analyses that I completed. And we looked at the baseline power of the building, and that gets to, more to the opinion. This is just the raw data comparison. And if the raw data showed that there was no period, then I think we could have said it's potentially a reasonable expectation.

But this is a problem, and these areas down here are a problem. What they're indicating is that nothing else in the building is absorbing power, only the reactor, and that's simply not realistic.

Q. And as you said, there's one of three options. Either FP&L is wrong, Penon and Fabiani are wrong, or there's manipulation on the data?

A. On, on the part of some party, yes.

Q. Okay. So basically one or the other is incorrect, and then the third option is that it was intentionally incorrect?

A. Right, by somebody.

Q. By somebody?

A. That's right.

Q. Okay. But you don't know which one is which?

A. No.

Q. Okay. So your opinion is simply that this is an area of concern where it drops below and the other areas where it drops below slightly are --

A. In the context of this one plot, yes.

Q. Okay. Now, the measurements taken by FP&L were taken at what time?

A. Midnight.

Q. Midnight. The measurements taken by Engineer Penon were what time?

A. Well, he was only in the facility I believe four times. So I would imagine he only collected the data. He didn't actually take the measurements. So that's why I believe that Fabiani actually collected the data in the logs and provided that to Mr. Penon.
Q. That's your belief?
A. It is my belief, yes.
Q. Okay. Do you know what data Mr. Penon received directly?
A. How would Mr. Penon receive data directly?
Q. It's called the internet.
A. Really? No, I have no idea what data. I would be interested to see. So he --
Q. Do you know if he did?
A. I do not.
Q. Do you know if he had a computer on site?
A. I believe that there were computers on site that were collecting data from, from the instruments, yes.
Q. Okay. Do you know if one of those was Mr. Penon's, or Dr. Penon's I should say?
A. I do not.
Q. Okay. Now, now you said that FP&L's data was recorded at midnight?
A. Yes.

Q. Let me show you a copy of the documents provided to us and ask you if this is the FP&L data you've seen. It's going to be marked as Exhibit 12. And it is bates stamped Industrial Heat_FP&L or, I'm sorry, FPL-000004.

(Whereupon, Exhibit 12 was marked for identification.)

Q. Is that the data that you're referring to, sir?

MR. LOMAX: Thanks.

Q. Let's see. Did I hand you mine? No.

You know what I think I did here, if I can, let me take a look at that for a second. I may have given you more documents than I needed.

A. Sure.

Q. No, that is correct. Sir, at the same time I'm going to give you another document, which we'll mark as Exhibit 13, which bears the bates number Industrial Heat_FPL-000054.

(Whereupon, Exhibit 13 was marked for identification.)

Q. Oh, you know what, I marked mine again.

A. This doesn't look like -- hold on a second. Excuse me. It doesn't look like it's the complete set of data, but it's certainly a subset of it.

Q. Was there more other than this that was provided that you understand?

A. I believe so, yes. I think there was a second submission that included more data before and after, but. 3/1. I believe so, yes, but I'm, I could be wrong.

Q. Okay. Now, turning, sir, to document page, bates number Industrial Heat_FPL-000044.

A. 44, uh-huh.

Q. Okay. You got that?

A. Yeah.

Q. Okay. Looking at the top of the page, it purports to be the reading for January 1, 2015?

A. Yes.

Q. Meter Number L0556058707?

A. Uh-huh.

Q. Okay. I'd like to now ask you to flip to the last page, which is Industrial Heat_FPL-000053. And this purports to be the meter reading on March 1, 2016?

A. Yes.

Q. And it's got Meter Number L0556058707?

A. Yes.

Q. Okay. You told me, sir, that the meter number had changed?

A. Yeah. I believe that I had seen that in the

data, but I don't know that this is all of the data. I, and I could be wrong.

Q. Okay. But, sir, this, you would agree, even if it's not all the data, this is the data between January 1, 2015 --

A. Yes.

Q. -- and March 1, 2016?

A. Uh-huh.

Q. Which encompasses the entire --

A. The date.

Q. -- test period?

A. Test period, yes.

Q. So the entire test period, at least according to this document, the same meter was used?

A. Yes. It appears, yes.

Q. Okay. So what information did you look at to indicate the meter had changed?

A. I don't know if it was the data before this or after, or maybe I was just mistaken.

Q. Okay. And you, you're not testifying at all as to the propriety of that information, whether it was done properly, properly recorded or otherwise?

A. No, I am not.

Q. Okay. Now, the other thing that somewhat concerned me with your graph here is there were certain periods, were there not, that no data was collected by FP&L --

A. **That's right.**

Q. -- but yet I don't see gaps in your FP&L line.

A. **Yeah. It's, it's hard to see on a graph of this scale. Hold on a second. Where is that document? Oh, it's, it's the one. Yeah, it's very difficult to see because this is a line plot rather than just the point data. I have produced a wide range of different plots and looked at the data in a lot of different ways, and this was just representative samples that highlighted the key points.**

Q. So the --

A. **In fact, also did smoothing of the data to, if there was any kind of a shift over time, just to kind of give the benefit of the doubt to the, the underlying measurements.**

Q. Okay. So where they had null reads, you assigned, what, an average for that time period where --

A. **No.**

Q. -- there was no --

A. **Not, not in this data.**

Q. Okay.

A. **There was just a gap.**

Q. Well, let's, let's look specifically at, let's see, May 20, 2015.

A. Okay.

Q. Okay. So between May 20, 2015, and June 20, 2015.

A. Uh-huh.

Q. Okay. There are at least one, two, three, four, five, six, seven, eight days out of a 30-day month, 31-day month? What is it? 31-day month. So almost a third of the days there was no read during that month, yet I don't see a single gap on your --

A. Yeah, this, this --

Q. -- line graph.

A. -- plot is actually connecting the points rather than showing the, the data points. So as I said, there were numerous different plots that I did to look at the data, both from a joint probability density function analysis techniques. I also looked at a wide range of other techniques, so --

Q. I'm sorry.

A. -- this one --

Q. What was that technique?

A. That's a joint probability density function analysis.

Q. What is that?

A. So what you do is you create a distribution of the two data sources so you can look at how those measurements correlate, so you can look at the distribution shape to find out if there's anomalous structure in the distribution.
Q. Anomalous structure in the distribution?
A. Yes.
Q. We're, we're comparing presumptively two data points on the same date to each other?
A. No. In a joint probability density function what you're doing is you're actually creating a distribution of all the days at the various power levels and corresponding the power levels measured by, in this case, Penon to the power levels measured by Florida Power and Light. So we could look to see how these distributions vary over time to see if there's structural changes in it.
Q. I guess I'm not understanding. Structural changes in the distributions of what?
A. Of the, the behavior between the two power sources. So you do a, you're creating a, a distribution of these power measurements.
Q. What, what do you mean by distribution of these power measurements?
A. So a, if you take, if you create a histogram,

so you look at all of the days that you had a particular power level and you bend them and you contrast that jointly with the two series, the two time series, then you can create a, a distribution, a joint distribution between two independent data sources. And then you can create a probability density. So how probable is this? What is the relationship between this? And two highly correlated signals will have a very defined structure. And when you contrast that with signals that are unrelated, then they will have a completely different structure.

So it's very difficult to see in a scale like this where there are probably, I don't know, 300 and, I don't know, however many days, 350 days or 360 days worth of data. It's very difficult to see when you just are connecting the points and you don't show the data line. So this plot is, is just one example of the analysis.

Q. Okay. Now, the, the plot below that says cumulative energy absorption. What did that tell you?

A. Nothing. I mean it just shows the flat points in the distribution. It was one of the things that we analyzed along the way to see if there were points where the cumulative energy were, were not related, but it was just not --

Q. Do they seem related to you here?
A. There are a couple of strange points where one signal is steadily going up and the other signal is flat, but it's very difficult to see in this. It would be far better suited if it was plotted on a log scale so you could exaggerate that and see that.
Q. Did you plot it on a log scale?
A. In other plots, yes.
Q. Is there a reason that this graph was included in your expert disclosure then if it --
A. It was just --
Q. -- tells you nothing?
A. -- an, it was an example. So actually this was plotted together in one function call, and so it was just together when we saved the file or saved the image out of the, the analysis.
Q. So you would agree with me, sir, that if FP&L's data was incorrect and there had been an error in the reading, your report would not accurately reflect the relationship between the amount of energy supplied by FP&L and that recorded by Engineer Penon and Mr. Fabiani?
A. Could you repeat that?
Q. Sure. You would, you would agree with me that if the FP&L data was incorrect, that would render

this graph and any opinion with relation to any time that it dipped down below to be invalid?

A. **For this specific graph, yes.**

Q. Okay.

A. **But there's more data.**

Q. What's the more data?

A. **If we look at --**

Q. Hold on. Okay. More, more within this report or --

A. **Yeah.**

Q. -- more --

A. **More in the analysis. I'm sorry.**

Q. Okay. We'll go through the analysis.

A. **Okay.**

Q. Okay. Now you said, and I want you to look at that again, you said that the readings were taken at midnight every night?

A. **I believe, yes.**

Q. Sir, I'm looking at the readings, and it says 12:00.

A. **Uh-huh. Yes.**

Q. Okay. You take that as midnight?

A. **Yes.**

Q. Sure it's not noon?

A. **No. In fact, we looked at that. We looked**

at the data both ways, assuming it was noon and assuming it was midnight. I asked the question, and I was told that it was noon. So I just -- I'm sorry. I was told that it was midnight, and so I --

Q. Who told you that?

A. Counsel. Based on --

Q. Counsel did?

A. Yes.

Q. Okay. Other than counsel, do you have any independent source?

A. No.

Q. Do you know where counsel got that information?

A. I do not.

Q. So you were relying on counsel for that opinion?

A. Yeah, they were the ones that got the subpoena --

Q. Okay.

A. -- and provided the data.

Q. Does this data change or the correlations change at all if the measurement were taken at noon as opposed to midnight?

A. No. That's why we did the analysis with the rolling 2-day average versus, versus just the single

data point averages, because, or the single data points, because we wanted to make sure that if there was an offset, that we weren't artificially penalizing one set of data versus the other.

Q. Okay. And, in fact, when you did that, that's what's reflected in Exhibit B, correct?

A. Take a look. Yeah. This is a 3-day rolling average. Actually, it has both data. It's kind of difficult to see with the, the line underneath. The, the FPL minus Penon data is the blue line. It's just the raw values. And then there is a, I would call that almost a gray line. Man, these colors are horrible, but the greenish line is the FP&L data minus a Penon 3-day rolling average.

So we took the, the FPL data because, or I took the FPL data because I was concerned about whether it was noon or midnight. And we did a rolling average to, over the 3-day period to end up with that value, and then plotted it.

Q. All right.

A. Plotted it, so we took the 3-day average of the FPL minus the Penon data, because the Penon data was --

Q. So this --

A. -- very smooth.

Q. This is the difference between the two, correct?

A. Yes. Yeah. That's, that's why it's on a different scale. And we show a zero value. So, so the axes are completely different. Do you, do you see that?

Q. Uh-huh.

A. So the zero value, this would be the difference between the two. So any days that you had a value below zero would obviously be an area that we would have to look at and understand is the FP&L data bad or is potentially the Penon data bad.

Q. And so, I'm sorry. Any areas where what?

A. Where the value went below zero.

Q. Okay. And, in fact, there are fewer times where that occurs I believe --

A. Actually there are more.

Q. There are more?

A. There are 17 days in this, and I believe in the other one there are 14 days.

Q. Well, if it's a 3-day average, that shouldn't be, right?

A. No. The data from Florida Power and Light, it had big, big spikes. So what we were doing is we were taking the difference between the smooth Florida Power and Light data and the Penon-provided data,

because the Penon data looked very smooth. So we took the difference, or I took the difference. I say we, me and several of my other personalities, took the difference and plotted it. And my recollection is that this was about 17 days.

And then in addition to that, we put a baseline power number on there, which was -- and unfortunately I don't know why this doesn't have the other days, but we requested additional days. And those additional days kind of give us an average before and after the test so we could see how much is the building itself consuming, you know, with the office and the fan and lights and, you know, the fan in the bathroom and the lights and the air conditioner and the, you know, whatever, the different parts.

We wanted to know, you know, what's the baseline power. Because clearly the difference, what you would expect in the previous plot is that the building is absorbing more power in general than what the reactor is using because the reactor is only a subset of the power absorption in the building, right, which I think makes sense.

Q. But that's not reflected here, is it?

A. I'm sorry?

Q. The additional days outside the testing

period?
A. In this, actually the data sets that I used, yes, included those other points so I could actually get a baseline number. In this plot. You're looking at the other one. I'm sorry. I'm looking at Exhibit B. So you see that red line on Exhibit B?
Q. Yeah.
A. Man, I apologize. This is very difficult to see these, but that red line is the nominal power that the building absorbed when the reactor was not running. And so --
Q. What do you mean nominal power that the building absorbed when the reactor was not running?
A. So if, if we looked at the previous plot and you look at a period -- let's look at Exhibit A again so I can try to, I'll try to explain it. If you look at Exhibit A, throughout the entire test, in general the building, the total amount of power absorbed from Florida Power and Light was higher than what the reactor.
Q. That's --
A. Which is what you would expect. We kind of expect that because there's an office and there's some lights. Those things are not being measured by the, the power analyzer of Penon. Then if you go outside of this

period when we were sure that the reactor was not running, or at least we had confidence that the reactor wasn't running. Like for example, the few days after we turned the system off and nothing was going on, the building was locked up. We could get an average of how much power is absorbed into the building without the reactor running.

So we wanted to know how much is the, kind of the baseline power of the building. You know, you've got some air conditioners. You've got some lights. You have some different equipment. Maybe JM Products was running some equipment, whatever they might be doing. And so then what we did was we said, okay, well, this is the baseline power. And then --

Q. Wait, wait. Baseline power is the average power for the year?

A. No. It's the average amount of power absorbed in the absence of the reactor system.

Q. Now, you say power absorbed. Power supplied by FP&L --

A. Yes.

Q. -- in the absence?

A. Absorbed by the building. The total amount absorbed by the building. And by power, Florida Power and Light has hourly data. We only have daily data

here --

Q. Now --

A. -- but it's the energy.

Q. Okay. So you would agree with me that you can't take an average and apply it all the way across a year, can you?

A. No. No. Because the reactor was running and we know --

Q. Well --

A. -- that the reactor was, different parts of the reactor were coming on and off, so.

Q. Even without a reactor, are you, are you representing to me that what, I don't know what this number is. Somewhere less than 50 kilowatt hours?

A. I'm sorry. Which one are you -- you're looking at Exhibit B?

Q. I'm looking at B, yeah.

A. Yeah.

Q. Less than 50 kilowatt hours was the energy used throughout the year without the reactor?

A. Yeah. We're saying that that is a, a representative baseline for the building.

Q. Okay. And that, and you got that off of what sample size?

A. For the samples before and after, which --

Q. How long?

A. Oh, I don't remember. There were, I don't know. There was quite a bit of time that they provided data for.

Q. I don't, I don't have that either.

A. Yeah.

Q. Wouldn't you agree with me that during the summer in Florida power usage is going to be substantially higher than the winter time?

A. Could be, yeah, but that would only make this worse. We try to draw a very conservative estimate. So if more and more power was going to more and more things outside of that, that would only make it worse because that line would draw up. Because let's say you had an air conditioner in the office space up front. If you were, had the air conditioner running, let's say 12 hours a day to keep the office space cool, then that would actually increase the amount of power that was going to --

Q. Well, sir, sir, you've attributed, and I, you know, for the most part the line of FP&L minus Penon or FP&L minus Penon 3-day rolling average is above that line with the exception of a few points of your average power.

A. Right.

Q. Or your baseline power as you defined it. During the month of November to December 2015, what were the temperatures outside?

A. Oh, I don't know. Florida, I'd guess probably in the 70s or 80s maybe.

Q. Did you look?

A. Actually, in the simulation data we used the NOAA published average temperatures to figure that out.

Q. Simulation data, what simulation data?

A. I'm sorry. That 's a different part of the --

Q. We'll --

A. -- what we'll talk about later.

Q. Okay. We'll get to that, but so you don't know what the energy usage would have been at that time for the building? In any year for that matter?

A. No. What we would do is just to look at the average of how much the building absorbed, but what we should say is that anytime that the number is below zero, it would indicate that there's an error somewhere either with Florida Power and Light or with Mr. Penon's data.

Q. Based on your average, but your average --

A. No, no, no. Oh, I'm sorry, the 3-day average, yes.

Q. But your average applies -- I'm sorry. I'm looking at your baseline --

A. Yeah.

Q. -- power.

A. So there are, I need to be careful. There are two things -- it's, it's actually energy per day. There are two things being shown here. There is a line, a dotted line shown at zero, right, meaning that anything below zero is, is indicative of the power absorbed by the reactor being higher than the power available from Florida Power and Light, and that's a problem. And why, and as I said, whether it's a problem with Florida Power and Light or with Penon's measurements or something else, we don't know at this point.

Then the other line is, if you consider that the building, which is the explanation in this previous plot, the explanation for the difference between what Penon and Fulvio Fabiani measured and what Florida Power and Light said they delivered, that difference would be the amount of power used outside of the reactors for whatever purpose.

Q. Okay.

A. Office, whatever. So that difference right there is reflective of the nominal power absorbed in, in

the building. But what we did was instead of using that, because that's really difficult to say because we don't know if, what was going on over in JM Products. What we did is we just looked at the windows outside of those periods of time to establish a very conservative number and drew that very conservative number on this. And so that's indicative of that number that I just described. Does that make sense?

Q. To be honest, not really.

A. Okay.

Q. But I, I'm not going to ask you to do it again.

A. Okay.

Q. The cumulative energy absorption, FP&L minus Penon, what does that tell you?

A. So what we're doing is for each one of these data points --

Q. I'm going to back you up for a second. What conclusion were you able to draw from --

A. Again --

Q. -- that graph?

A. -- this was included in here. The, the only area of concern is actually right here where the cumulative energy is actually decreasing in that period of time. So there's a slight decrease in the cumulative

energy when you compare Florida Power and Light to Penon, which indicates that one of those measurements is clearly in error because you can't give energy back.

Q. But you don't know which one?

A. No, we don't.

Q. So what does this, what does this tell you other than there's an error in one of the measurements?

A. What this tells us is anywhere that the value is below zero is a, is an impossibility in the case where the measurements are correct. If the measurements are incorrect, then that may be described by an error in the data.

Q. Okay. So it says that there is an error in the data, whether manipulated or --

(Conference call interruption.)

Q. So sir, that just tells you that there's an error, there's an error or inaccuracy in one of the data sets, correct?

A. Yes.

Q. Okay.

A. I think that's fair to say, yes.

Q. So you've got two data sets that report one thing consistently, fairly equivalent to each other, and one data set that is different. And of those three data sets, at least one of them is incorrect?

A. I would agree with that, yes.

Q. Okay. But you don't know which one?

A. No, not at this point.

Q. And the investigation you've done doesn't tell you whether it was Penon's or FP&L's or Fabiani's?

A. Penon, FPL -- yes.

Q. Okay. How did you decide on what data to review?

A. In what context? What are you --

Q. In, in doing this analysis.

A. Oh, in this?

Q. Yes.

A. I took the, the data from the final report. I took the data that Fulvio Fabiani had provided us, and then I took the data from the, the Florida Power and Light subpoena. That data were the only sources that I was aware of for power absorption data.

Q. Okay. Who provided you that data?

A. These three sources of data? Well, I received a copy of the final report from I, I believe I may have even been on the distribution from Mr. Penon. The data from Fulvio Fabiani was what he provided when he met with us in Jones Day office. And the Florida Power and Light data was provided to me by counsel.

Q. So ultimately based on the graphs that you did here, you came to the conclusion that the results were at odds with the amount of power reported between the three measuring entities, we'll call them?

A. **Yes.**

Q. But you make no opinion as to why they're at odds?

A. **Not at this point.**

Q. Okay. Your next opinion stated, sir, is that, "Mr. Murray compared these numbers to the actual power provided by FP&L to the Doral location and found numerous inaccuracies" -- I'm sorry. That's part of the same one.

A. **Which, which, what's the --**

Q. Okay.

A. **-- document number on that one?**

Q. That is 11.

A. **Oh, it's this one. I'm sorry.**

Q. Yes, your report. I'm sorry. The second part was, "Mr. Murray also compared Penon and Fabiani's data to the historical average amount of power data." Is that what we were discussing?

A. **Yes.**

Q. That red line?

A. **Yes.**

Q. And what did that tell you?

A. That just said if we, if we had a conservative estimate for the, the amount of absorption into the building for other purposes besides the reactor, that, in fact, there were many more days where the measurements were below, but again it's the same problem. If Florida Power and Light's data was inaccurate, then it's, it's, there are equal probability of which source of data was incorrect.

Q. Okay. So it doesn't tell you one way or another whether there's been manipulation or, or otherwise with respect to any set of data?

A. No.

Q. Your next opinion states that you "compared the reported power input to the E-Cat plant reported by Penon against the reported coefficient of power, COP, reported by Penon as reflected in Exhibit C." Let's look at Exhibit C for a moment. And in doing so, "Mr. Murray will testify that there is no logical reason why the COP should be changing inversely to the amount of power inputted given the same E-Cat plant was used throughout the guaranteed performance test." I'm sorry, what was the, the formula for COP calculation?

A. It was I believe based on our reproduction of the final report data, it was the energy out over the energy in, or power out over power in on a per day

basis.

Q. Okay. So the energy out is the numerator, correct?

A. Yes.

Q. The energy in is the denominator?

A. Yes.

Q. Okay. So logically speaking, COP would increase one of two ways, by the energy out increasing relative to the energy in, correct?

A. Uh-huh.

Q. Or by the energy in decreasing, correct?

A. Uh-huh. If the energy out stayed constant.

Q. What if the energy out increased?

A. Well, then it would even increase more.

Q. Okay. So let's look at your graph. Your concern over this is that, and you say there is no logical reason why COP would increase when energy in decreases?

A. Uh-huh.

Q. How do you come to that conclusion?

A. So what I was referring to is throughout the entire test period there were numerous points that were documented in various reports and along the way of reactors going offline. Mr. Fulvio Fabiani provided us with a log, actually in Italian that had to be

translated to English, that showed this reactor went offline and that reactor went offline, this Big Frankie went offline, it was brought back on. It gives us intervals of time.

And the thing that we saw was that when a reactor went offline, the COP went up and the output energy stayed the same, but we know from the physical configuration that the pump system on the front end that provides water to these systems is feeding the individual reactors. So if you turned off a reactor -- and you would expect a COP to be constant, but let's say he had a COP of 100. When you turned off a reactor, you would expect the COP to be constant, but the power output would go down.

And this, and instead, what we saw was that when a reactor was taken offline, the COP went up and the output power stayed exactly the same, which in my opinion is consistent with measurement error and particularly the measurement error associated with the flow meter. Because if the flow meter was flowing water through it and it was inaccurately measuring just because it was incorrectly sized or wasn't properly implemented in this system, it may read the same exact invalid number below the minimum.

And so it was indicative of, hey, this is an

obvious problem. I, it is my opinion that any competent engineers would have seen this and said wait a minute, we have to understand this.

Q. Okay. Let me ask you a question. If you have two devices, let's say we have two reactors.

A. Sure.

Q. Each operating at 50 percent capacity.

A. Okay.

Q. Okay. And they're each capable of producing 50, what, kilowatts? Does that make sense? Kilowatts?

A. 250, but okay.

Q. Okay. Let's say it's 250.

A. Okay.

Q. Each, right?

A. Uh-huh.

Q. Okay. So that means when they're operating together at 50 percent capacity each, they're putting out a total of 250 kilowatts, correct?

A. Okay. I buy that.

Q. Now, and they're receiving energy in to operate?

A. So input.

Q. Yeah.

A. Yeah, the heating energy, yes.

Q. Okay. The heating energy to those two units.

A. Uh-huh.

Q. If one of those goes offline and you increase the energy to the remaining unit, okay, that means not necessarily an excess of what -- I mean you could double the energy to that second unit and still at the same be at the same energy input, correct?

A. Last week when I was sitting in on Mr. Rossi's deposition, he specifically stated that they did not have the means to control the energy input when reactors went offline, which is consistent with what I understood. So the scenario you're describing is inconsistent with the testimony that I, I listened to last week.

Q. I'm sorry. You believe he said that he could not, he could not control the energy input to the units?

A. Yeah. He could not, he could not control the COP by increasing the energy to a unit. That's what I, that's what I believe I heard last week. And furthermore, that when we looked at this, the question was how would you control the heating elements in each one of the individual units? Because as was evident and when we visited the plant, numerous of the actual elements were pulled out and taken offline. They were covered up with hose, little hose covers like garden hose covers.

Q. Off the Big Frankies?

A. Yes, yes. Many of the actual reactors were completely disabled when we were there on February 16th and 17th. I, I took pictures of it. I was kind of surprised to see that all of them were not functional. And so what we saw was a lot of failures. And so what would happen is if, if you were in a condition when at several points during the test -- in fact, in the October time frame I think Mr. Penon came back to the site and he identified all of the reactors that were turned off and disabled. He indicated that by a zero amperage input to them when he was measuring the system.

And so when you look at that, what you would be doing is you would be overdriving certain heater elements, but you didn't have the ability to increase the water flow because some of those pumps were routed to Big Frankie 1, some were routed to Big Frankie 2, some to 3 and some to 4. So it would have required a complete reconfiguration of the water flow system. So in my opinion --

Q. How were the pumps controlled?

A. How were the pumps controlled? They looked, looked to be manually controlled on the front panel.

Q. Okay. So, so if you have one system go down, somebody could go and manually --

A. So we looked at that --

Q. -- turn off the pumps, right?

A. So we looked at that and we took pictures of the pump configuration when the plant was still operational on the 16th, and what we saw was that the pumps were in a fixed, almost maximal rate. And, in fact, we also saw that some of the pumps had sediment and, and biofouling in some of the lines, indicating that there's no flow in those. So those pumps were disabled.

And so it's, it's very unusual. You would expect a system like this to maintain a constant coefficient of performance nominally, in particular considering that the system was originally supposed to operate I believe it was 64 reactors in the Big Frankie coupled with 51 of the smaller reactors. And at the onset of the test all 51 of the other reactors were disabled, and by the time we got there many of the Big Frankie reactors were disabled. And furthermore, we know from the data that Mr. Penon provided, numerous of the Big Frankie reactors were disabled in that October time period when he was there.

Q. Okay. Now, taking this one at a time. If all of the reactors within the E-Cat unit were operational at their maximum capacity, how much energy would be put out by that machine?

A. I have no idea.

Q. Okay. So you really can't testify that any particular reduction makes it impossible that the amount of energy reported by Dr. Penon could not have been achieved?

A. What I can say as, as an engineer is that taken, taking all of these factors together, the flow rate, the pressure measurements, the, the adding of water, the inability to see what's on the other side of the plant, the lack of defining the state for the output steam as well as the input steam, taking them on the whole, it seems highly unlikely. In fact, in my opinion I would say it cannot happen.

Q. What cannot happen? The amount of power --

A. Yeah.

Q. -- the input?

A. The amount of power going up proportionally when they turn off more and more reactors cannot happen.

Q. The amount of power went up or the COP?

A. Well --

Q. Please --

A. Let's be careful. Let's be careful. So if you look at the formula for the COP, and let's say in terms of energy. We'll take it on a, energy on a daily

average. What happened was the amount of output energy was effectively not, I shouldn't say constant, it varied some, but the input energy to the system actually went down. So we actually see a reduction in the input energy. So this disproportion means the output energy was constant and the input went down and, therefore, the COP went up. So if I put in less power, how could that happen? It's just completely illogical.

Q. Okay. How long, this reaction that's used on the device -- first of all, do you have any background, education, or work experience with LENR technologies?

A. Not before I went to Industrial Heat.

Q. Okay. And any experience with nuclear reactors prior to that?

A. No.

Q. Okay. So are you familiar with nuclear reactors?

A. Yes, I am.

Q. Do you feel competent to testify as to them?

A. No, no.

Q. Okay.

A. I'm not into the full operation of a nuclear reactor, no.

Q. Now, when the reaction is started in the E-Cat and you remove the power source, the input power, does the reaction, does the reaction stop dead?

A. No. That was part of the, all of the early data analysis, was the information that was provided to me when I was reviewing in June of 2015 was there was a description of pulsing the power and having a reaction sustained for some period of time and the, having exactly the right frequency for those associated powers. And, in fact, that's something when we did replication experiments, we attempted to, to incorporate those, that functionality to the system.

Q. Okay. But the question was when you remove the input power, turn it off, does the reaction stop automatically?

A. If the --

Q. Just right there on the spot?

A. If the, if this is a true functional technology as it has been described, then the answer would be no.

Q. Okay. So if we take, in that case when, when they're going offline, if we take an output power of 100 with an input power of let's say 2 for example.

A. Okay.

Q. That would be a COP of 50, right? 100 --

A. Okay.

Q. -- divided by 2?

A. Sure.

Q. So that would be 50. So if we have that same setup and we have an input or, I'm sorry, an output power of any number, let's say it's 50, but we've removed the input power completely, so it's a 50 percent reduction of output power, but removed any input power. The COP is infinite, is it not?

A. I never observed in any of Penon's report any point where they had removed the input power completely. Neither --

Q. Well, removing input power from one or more units, not, not from the whole device. But there are points where there is a reduction of input power into these devices, right?

A. Well, their devices were taken offline so they could be worked on. In fact, if you look at the, if you inspect the plant, you will see that the original power inputs, the, the heater elements were replaced through the tests. Heater elements were failing, and so they kept bringing people in to replace them. And, in fact, Fulvio Fabiani told me that he, he, in fact, helped to replace some of those. And when they did that, they replaced them with different heater elements.

So in that context there were lots of reactions offline for a long period of time. And if you

were in there removing elements while there was a nuclear reaction ongoing, I think you would have to be very concerned about the health and wellbeing of the people working on it.

Q. Why?

A. Because it's a nuclear reaction that's unknown in physics.

Q. Okay.

A. So you would have to be concerned about any forms of radiation that may be occurring.

Q. Have you ever done a radiation test on these? Do you know if they put off radiation?

A. Oh, we, yes, we did numerous radiation tests. We used Geiger counters and other tech, techniques to measure. There was no radiation that we were aware of.

Q. Okay. So --

A. And, and I believe that Dr. Rossi, or Mr. Rossi had done the same thing.

Q. Okay. So there was no radiation. Why would you be concerned of the health --

A. If it's a nuclear reaction. Ionizing radiation is a, is a major concern. So you would do, have a --

Q. It's a concern?

A. Yeah, you would do preventive. So it would

just be a concern.

Q. Wasn't, wasn't one of the big selling points for Industrial Heat that you could have this reaction without the radiation?

A. I don't know what their selling points were, so.

Q. The, the big thing behind this energy seems to be that there would be no radioactive by-product. Sounds great, doesn't it?

A. Sure.

Q. That's what was sold to investors, but now the complaint is, is that you can't have people working there --

A. No. It's a --

Q. -- because --

A. It's a measure of safety. If you were in working and let's say -- and I'll expand on that, if I may. Barry West indicated to me when I spoke to him that there are -- and there were documents that showed a bunch of the boards being blown up. So there was leakage current into the system. And so I would have concerns about safety whenever somebody is working on a system like that if you didn't carefully manage it. In fact, Barry indicated, he said this to me, that you had to be very careful about what you touched in the system

because you could get an electrical shock. So yeah, safety I think is an important measure in any system analysis.

THE VIDEOGRAPHER: Five minutes.

Q. Five minutes. So you'll agree with me though, sir, that if you remove the power source and a reaction continues, that the COP would go up because of a decrease in the amount of energy being supplied, correct?

A. For some, yeah, for whatever the theoretical period of that, that reaction, yes.

Q. Okay. So there may, in fact, be a logical reason as to why the COP would be changing inversely?

A. Not for these extraordinary periods of time. I mean I presume what you're suggesting is that for weeks and months, when you took a reaction -- or one of these reactors offline that you would, you would see this reaction continue to sustain itself inside the system. And I don't believe that there was any evidence or any discussion in anything that I have seen to indicate that this would happen on a nearly continuous basis while they repaired the reactors and brought them back online.

Q. Now --

A. So I would disagree with that comment.

Q. Now, if the reactor becomes more efficient, that means COP is increasing, right?

A. If the reactor became more efficient, can you --

Q. All right.

A. What do you mean by --

Q. Okay. At different temperatures, this catalyst that's being used, did it react the same at all temperatures?

A. I have no idea.

Q. Okay.

A. I was not privy to the information on the catalyst.

Q. So if, if the catalyst or if this reaction was -- is it possible that it is more efficient at higher temperatures?

A. It is possible. There's another really nagging issue in this space. Imagine the scenario that you describe where you took half of the reactors offline and you increased the reaction power or the, the other reactors stayed steady, but the ones that were turned off continued to produce heat for some extended period of time. And I believe earlier you suggested that turning up the power, the amount of heat in some of the reactors would also be the alternative to sustain the

reaction.

If that's the case, the real issue becomes how much power can you dissipate in one localized portion of a reactor. The Big Frankie boxes were approximately let's say four feet by four feet and let's say nominally maybe 18 inches thick. And if you disabled more and more reactors and you increased the power in the individual reactors, then you would be concentrating more and more power into that area. And then what you have is a situation where the plywood box that these reactors are made out of would become very hot and very -- you would have localized heating from a heat transfer for, heat transfer perspective.

So from that perspective it presents a whole series of other problems. You know, if you, if you said that these reactions can be turned off and let run for months and months or, I shouldn't say months and months. Let's say --

Q. What --

A. -- a period of time of two months.

Q. Sir, I'm sorry. I'm going to stop you because I have limited time here.

A. Okay. Yeah, I'm sorry.

Q. With respect to your opinion regarding the inverse relationship of the input power to COP, did you rely upon any written documents or theories or otherwise?

A. I relied upon the information that I was provided about this system.

Q. Are there any publications that would support your views that you know of?

A. Not that I am aware of.

Q. Okay. So you didn't rely upon any literature or textbooks or anything to that effect?

A. Yeah, there's very little literature --

Q. Well --

A. -- regarding this. There's the patent application, which I have read, and there are other aspects --

Q. What specific --

A. -- on (inaudible).

Q. What specific methodology, methodology did you apply to form your opinion that there's no logical reason why the COP should be changing inversely to the amount of power input?

A. The logic that I used was that --

Q. I didn't ask the logic.

A. I'm sorry.

Q. Is there a theory or methodology or --

A. The methodology was to review the data

provided, analyze it, and to look at the, the time history of the energy absorption provided by Mr. Penon and Mr. Fabiani.

Q. And if I take the time, could I, could I go through and make those comparisons and come to the same conclusion?

A. I don't know if you could. That's me projecting onto you. I'm not sure. You told me before you only, you slept through math -- all your science classes, so I would have to say no.

Q. I said I slept through one of them.

A. Oh, all right. For the record, it was one.

MR. ANNESSER: Okay. We need to change the tape.

THE WITNESS: Okay. I need to run to the restroom.

THE VIDEOGRAPHER: We're off the record at 3:55 p.m.

(Recess taken 3:55 p.m. to 4:03 p.m.)

THE VIDEOGRAPHER: We are back on the record at 4:03 p.m.

BY MR. ANNESSER:

Q. Sir, I think previously you had testified with respect to Mr. Dewey Weaver that you had hundreds of e-mails with him.

A. From him.

Q. Or from him. Okay. Were they hundreds of e-mails regarding the E-Cat for the most part?

A. No. No, he, as I described earlier, Dewey was kind of like a business development outreach guy looking for people that were doing research and technology development in this area, trying to build relationships for the, you know, what they described as the portfolio. And so he was always sharing lots and lots of information about different people that he had met and what they were doing and what people were interested in and things of that sort.

Q. Okay. Now, getting to the next opinion that you have in your report regarding heat simulations. You say, "Mr. Murray's simulation demonstrates how the heat would typically build over time to achieve a steady state temperature. See thermal simulations." What, what is thermal simulations? Is that a publication?

A. No. It's the results of thermal simulations that I have run. And so I, I did a series of OpenFOAM 3D simulations of buoyancy-driven flow inside of the building. So when we were there, one of the, on, on February 16th and 17th, 2016, one of the things I noticed was it was not as hot in the facility as I was kind of expecting. When we got there, and I checked

back in the record of the final report, it looked like the days leading up to the end when they turned off the system, it was, it was operating at near full capacity.

And so from that standpoint I also observed that there was a skylight and then there was a vent, but when we were there that day or those days the vent was never running. And so I was a little perplexed and tried to figure out how hot should it be in that. So we put together some buoyancy-driven flow simulations of the building based on the estimates for where the wall was and how big was the, the, the box on the other side. And we made the assumption that some amount of heat, various levels of heat had to be dissipated through that box.

And so we did a 3D simulation using OpenFOAM, a steady-state buoyancy-driven flow simulation so that we could try to assess, you know, how hot should it have been, just to kind of do a sanity check, make sure things made sense.

Q. And your opinion was that the room would have been heated to a temperature unsuited for a human working environment?

A. Yes.

Q. What temperature?

A. We did it for 100-kilowatt dissipation. We

did it for 500-kilowatt dissipation, 750, 250, and 800. The 100-kilowatt dissipation reached a steady-state temperature in the building -- I drew a --

Q. Okay.

A. I'm sorry.

Q. I'm going to stop you for a moment.

A. Okay.

Q. Let's just go to the 800.

A. Yeah. I don't have the data. I, I haven't looked at the 800 data since last August, because it was extraordinarily hot. I, the data I focussed on was the 100-kilowatt dissipation in the building.

Q. Is that the data that you had provided to Industrial Heat back when you made it?

A. The 100? Yeah. I provided 100, 250, 500, 750, and 800, various different simulations.

Q. Do you know why that has never been provided to us?

A. Well, those, those simulations, they, for some reason, I don't know why, but when I converted the video simulations, they were corrupted.

Q. But I think you testified that that was when you sent it to counsel, but --

A. Yeah.

Q. -- that Industrial Heat had it previously?

A. Yeah. I, I don't know if anybody at Industrial Heat, I'm, I'm sure that they, people have reviewed it. I did take some screen shots as well. In fact, I'm pretty confident that in the data set that we, that we --

Q. Here's, here's my problem, sir.

A. Okay.

Q. We're, we're here today deposing you, but I've never seen these before.

A. Okay.

Q. So can you describe to me specifically the assumptions that you've made in creating these? For, for example, I do want to ask you about something you said though. You said the vent was not on.

A. Yes.

Q. What do you mean by that?

A. The fan was not turning in the ceiling vent that, when we were there on the 16th and 17th.

Q. Was there a fan in the ceiling vent?

A. There was some type of device, but there was no movement in there. So we looked up there, and I took pictures of it, and we couldn't see it. So my assumption was that there was no fan moving. Maybe there was a fan, maybe there wasn't, couldn't quite see, but couldn't see any blades moving. So I assumed that

it was open and available as a vent to the outside world.

Q. Okay. Did you make that assumption in your simulation?

A. I did, yes.

Q. And how large was that vent?

A. I think we modeled it at about three feet in diameter approximately.

Q. And how big is it actually?

A. We have no idea. I'm not on the roof.

Q. Okay. That was --

A. I did a best estimate from the pictures that I took.

Q. What about the size of the room?

A. We measured that when we went back in, I don't remember if it was March or April we measured that.

Q. Was that before or after you did your simulations?

A. That was before.

Q. Any other ventilation?

A. There was a, a, a light in the front. I'm sorry. A, like a skylight more towards the other end. There were three doors, but while we were there they were closed, and the main door was closed as well.

Q. Do you know if the skylight was actually a vent, the second one?

A. The pictures that I took, it did not indicate that it was a vent. It was just a skylight.

Q. You don't know though?

A. Not -- based on the pictures, what I observed, it was a skylight.

Q. Okay. So if that was a vent, that would change your calculations, right?

A. Slightly, yes.

Q. Okay. And if the bay doors were open for a majority of the time that the plant was running, that would change your calculations too, wouldn't it?

A. Yeah. It would actually make the calculations worse in some regards.

Q. So more heat would be inside the building than if --

A. No. It would be the flow of the heat, because it was a buoyancy-driven flow. So what happens is we assumed that the heat that was dissipated inside the, the box on the other side of the wall, so the steam went over. Something happened in there. We don't, you know, I wasn't privy to see what was going on over there, but we know that the, that the steam was condensed back into water. So it dissipated heat inside

of that space.

And so what we assumed was some percentage of the heat that was dissipated in that space was actually buoyancy. It was heated through the walls, uniformly heated through the walls of that enclosure, and it caused a buoyancy-driven flow. So buoyancy-driven flow causes huge heating. And the hot air rises, the cool air falls, and it actually creates a large wind when you have very high temperatures and a lot of power.

Q. Okay. So the hot air would go up to the area where the vent is, right?

A. Uh-huh.

Q. Okay. Wouldn't that vent out?

A. Some of it does, yeah.

Q. Okay. And so as it's going out, it creates actually by, by venting out that way, in essence, a vacuum into the --

A. Yeah, but pressure differential.

Q. Pressure difference?

A. And it wouldn't be a vacuum.

Q. Okay.

A. But it would be a pressure differential, yes.

Q. Okay. So by opening those doors, cooler air would be brought in?

A. Could, yeah, but the --

Q. Which --

A. -- the flow is actually pretty amazing how much flow there was in the room. So because there was a wall, there was a half wall, I don't know if you recall, but there was a half wall. And so you heat, you cause this flow. The flow comes up and collapses, and it rolls back over. So that was the basis of our assumptions for our simulation, was that the vent was open. So air could go out the top, but the doors were closed, like when we were there on that day in February.

Q. So you didn't run a simulation with the doors open?

A. The doors weren't open when we were there.

Q. But you do realize they open and did --

A. Yeah.

Q. Did you ask anyone there whether they were open the majority of the time that it was running?

A. No. Because --

Q. It was just --

A. -- we were just looking at it, why, specifically I was looking at why wasn't it hotter and more uncomfortable in the building when we were there when it was dissipating all this out.

Q. Were there ventilation fans?

A. I'm sorry?

Q. Ventilation or, I'm sorry. Were there, were there fans --

A. Yeah.

Q. -- to move air?

A. There were two fans located kind of at the aft end of the building, kind of the, the rollup door side of the building.

Q. Yeah.

A. They were not operational when we were there either.

Q. Okay. But did you work those into the simulation?

A. No, because they weren't in operation when we were there.

Q. Just for that short period while you were, did you ask anyone whether those were normally in operation --

A. Yeah, actually we did.

Q. -- during the --

A. We asked Fulvio Fabiani if they were.

Q. What did he say?

A. He said from time to time they were on, yes.

Q. Okay. But how often is from time to time?

A. You would have to ask Fulvio Fabiani.

Q. What was the air transfer rate in that building?

A. Meaning, what do you mean?

Q. Like how often did the air circulate through?

A. You mean vented outside and fresh air coming in or?

Q. Yeah, absolutely.

A. We, I made an assumption about the building, and so I have no idea.

Q. What was the assumption you made?

A. The assumption was that there was a vent at the top and --

Q. Just one?

A. The, yes. The, where the vent hole was above, and that it was just heating of that room.

Q. Okay. If there was a second vent, would that, would that change your calculations?

A. Yeah. It would change the heating, yes.

Q. And if the doors were open, that would change the calculations as well --

A. Yes.

Q. -- for your simulation?

A. Yeah. But they weren't there when I was there.

Q. What about if the fans were on? Would that change your calculations?

A. **For some of the convection, yeah. It would actually change the calculation somewhat, yes.**

Q. How large were the bay doors?

A. **I would have to look in the simulation. I believe that they were approximately 10 feet wide and about 14 feet high, but that was an approximation.**

Q. Okay. What was the construction of the building?

A. **Cement. So there were concrete walls, and there were concrete ceiling modules with a kind of beam structure.**

Q. Do all types of concrete absorb the same amount of energy, same amount of heat?

MR. LOMAX: Objection to the form of the question.

A. **No. All concrete is not identical.**

Q. Okay. So did you make any specific notation as to the type of concrete?

A. **Yeah. We used the average for concrete for the material, and we also used the average temperature for that region from NOAA, and we used the average wind flow velocity on the outside of the building.**

Q. Were there any windows in the building?

A. **There were no windows in the back section that I had access to.**

Q. Okay. What about the front section?

A. There appeared to be some windows in the office area.

Q. In the office area, so downstairs?

A. Well, there were some windows in the front, and there may have been some windows up above as well. I was never in the office area.

Q. Do you know what was up on the second floor?

A. Huh-uh.

Q. Okay. What about a heat exchanger? Did you see the heat exchanger?

A. We were not given access to anything on the other side of the wall.

Q. Okay. Now, if there was a heat exchanger there, would that affect your calculations or simulation?

A. That's why we actually did a 10 percent waste heat calculation, the 100-kilowatt calculation. Because if we just gave the benefit of the doubt that maybe there was some mechanism that we were not privy to dissipating most of that heat, you would still have losses in the system and you would still have to get that heat out. So what we assumed, which actually was a very generous assumption, was that in the case of the 100 kilowatt, that the, a 10 percent waste heat was

actually a very modest number compared to the 1,000 kilowatt plant waste heat.

Q. What temperature was the, the room at 100 kilowatts?

A. So what I did was I drew section lines along two locations. I drew a line directly down the path through the door that went from the front to the back, and then I drew a line up above. And on those lines I showed the temperature at each one of the fine element points. And the temperature ranged from about 55 degrees Celsius up to about 68 degrees Celsius along those two lines and in the section line.

There were other places where it was all the way up at 100 degrees C, but I felt like, you know, that was the area where most people were operating and working, so that would be the area to be concerned with.

Q. Do you know what the specifications of the heat exchanger were?

A. I was -- which heat exchanger?

Q. The heat exchanger used at the facility.

MR. LOMAX: Objection to the form of the question.

A. I don't, I don't have any information about a heat exchanger in the facility.

Q. Okay. And so you didn't use any of that information in preparing your simulation?

A. **Well, it wasn't provided, yeah, so I don't have that information.**

Q. Okay. So you, you only performed a simulation assuming one vent, closed doors --

A. **Uh-huh.**

Q. -- no heat exchanger?

A. **Well, I mean so here's the, we have to be careful when we say no heat exchanger. I assumed that there must have been some mechanism to dissipate a good amount of the heat because there was no, clearly there was no work being done in the system because there was no pressure, right. The pressure was reported at zero continuously throughout the test. So there was no work being completed.**

So if you consider that, I said, well, let's just give them the benefit of the doubt and say 90 percent of the heat they were able to get rid of in some way. Maybe that was your heat exchanger. Maybe that was something else, but there were still losses in the system. So the rest of that heat I said was, well, let's try 10 percent, and then let's try 25 percent, and let's try 50 percent, different levels of efficacy of a heat exchanger, and then do the simulations and look at it and see what the temperature was.

So I was surprised to see that the temperature in the simulation would reach as high as it did even at 100 kilowatts, but then I reflected back on the fact that it's Florida. It's pretty darn hot. There was no air conditioning in the building other than the air conditioner for the small ISO container lab. And furthermore, the -- sorry there -- the, so, I lost my train of thought with that.

Q. What exterior or, exterior air temperature did you presume if you were --

A. 25 degrees Celsius.

Q. Which is what Fahrenheit?

A. I don't know. You would have to do the calculation. Say about 80. Approximately.

Q. You don't know what the losses were on the heat exchanger, do you? You're just --

MR. LOMAX: Objection.

A. I've --

Q. -- making an assumption?

A. I, I've, I don't know.

Q. Okay.

A. I didn't know about any heat exchanger.

Q. Okay.

A. So for the fourth time, I'm not aware of any heat exchanger.

Q. Okay. So you made assumptions based on guesses, based on --

A. I made what I --

Q. -- very limited information?

MR. LOMAX: Objection to the form of the question.

A. I made what I believed in my engineering judgment were reasonable assumptions about modeling the building in a way that reflected a very conservative estimate of what the conditions would be.

Q. Well, your conservative estimate and mine might differ because my conservative estimate probably would have had bay doors open at least part of the time.

A. But when I was in the building the doors were not open.

Q. And you were there for how many hours, sir?

A. We were there all day on the 16th and all, and about half the day on the 17th. And you were there with us.

Q. And was the plant running the entire time on both days?

A. The plant was running for up to 10, up until 10:30 on the first day when they shut it down, but as you said before, even if you turn off the, the heaters, the reaction will run for apparently months as you

showed in or as you discussed in your COP arguments. So turning it off doesn't mean that it immediately turns off.

Q. Now, sir, in these steam systems, the pressure is only necessary if you're dealing with mechanical work, right, not, not simply where heat is used; is that correct?

A. That's right. If you want to heat something to let's say 103 or 104 degrees C, you would need pressure. You have to be able to have enough pressure so that the steam will flow through the pipes and have the loss, overcome the losses in the pipes. Remember how I described all the elbows and the 90s in the length of the run? There are natural losses in the piping system that you have to overcome that pressure drop.

So in a case where you're, where you would have very low, very low pressure, for example, like maybe a, a, a laundry service, they may do something like that. When you do that, you can't do work. So there, it wasn't like there was pressure turning a turbine or pressure turning some other device. All that was happening was that steam was being used to heat something. And so what you're doing is you're converting the, the, converting this higher temperature area, transferring that heat to some other lower

temperature area, and condensing the steam back into water, and recirculating it back to the other side.

Q. And what amount of pressure or vacuum would have been needed to move that amount of steam?

A. My recollection, based on the information I had, was about 10 PSI pressure drop, but it is impossible to say without knowing what was on the other side of the wall. I mean if there was a bunch of additional plumbing or turns or corners or ups or downs, then that number goes up because there are more losses in the system.

Q. 10 PSI?

A. Approximately. And I know I'm mixing units on you there, so I'm --

Q. You are.

A. -- sorry about that.

Q. So your thermal simulations, do they set forth, the simulations that you've done, do they set forth all the presumptions and data that you put into them?

A. Yes. It's all in the simulation files, all of the assumptions and all of the data.

Q. Okay. Do you know whether those have been provided?

A. I believe that those were conducted for our

attorneys, so I, I don't know what was provided.

Q. You don't, you don't plan on presenting those to a jury, do you?

MR. LOMAX: Objection --

A. I do, yes.

MR. LOMAX: -- to the form of the question.

Q. You do?

A. Yes.

Q. So you, you plan on using those simulations in front of a jury, yet somehow they haven't been provided to us prior to your deposition?

A. I don't know what's been provided.

MR. LOMAX: Objection to the form of the question.

A. So I don't know what has been provided. I provided those to counsel, and I provided them as a basis for understanding what was going on in the building.

Q. As well as a report?

MR. LOMAX: Objection to the form of the question.

A. Yes. I think I, I believe I did write a, a report.

Q. Okay.

THE VIDEOGRAPHER: 20 minutes.

MR. ANNESSER: 20 minutes to?

THE VIDEOGRAPHER: Your cut off.

MR. ANNESSER: To my cut off, okay.

Q. Going to the next opinion that you give as to water flow. We've talked about this to some degree.

A. Yes.

Q. I'd like to ask you about the methodology, specifically what you measured and the angles at which you tested them at.

A. I don't have the report in front of me, but the, we measured the flow rate as the, we measured the flow rate at, at the, the PoWoGaz adaptor (sic) flow meter using its NC connector interface, the electrical interface. We measured the tumbler odometer device on the top of it as was done in the plant, as, as we understand was done in the plant. And we measured the actual flow rate using a calibrated flow meter when we pump the data from a 1-meter cubed lower chamber up to the inlet of the pipe and let it flow down the, the system.

Q. One thing I want to go back to here. I want to mark this as Exhibit 14. Show you this document.

(Whereupon, Exhibit 14 was marked for identification.)

A. Okay.

Q. This document has bates number IH00120283, which appears to be an e-mail from you to Tom Darden, Dewey Weaver with copy to Christopher Pace -- I'm sorry, copy to Dewey Weaver, copy to Christopher Pace, JT Vaughn, April Knight, Brian McLaughlin, and Ms. Watkins. And Mr. Lomax.

A. Uh-huh.

Q. And this is regarding flow meter testing?

A. Yes.

Q. Okay. On the second page of this document, there's a small part that's not redacted. It says, "And we are lucky he did not burn down the whole building. In my opinion, there is no possible way even in theory that the BF systems as they were built could support a large amount of heat."

A. Yes.

Q. Was this part of your opinion?

A. I don't know what it was. It's redacted.

Q. Was --

A. And I, to be honest --

Q. Was that --

A. -- I don't know what was in there.

Q. Was that a report of the flow meter testing, as it says regarding --

A. I --

Q. -- flow meter testing?

A. I have no idea because it was redacted. I, I don't know. I indicate in the first e-mail, "The flow meter testing is ongoing." And then I go on, "Attached are three 500-kilowatt simulation videos. I have other simulations complete that I need to make videos out of. It should be very hot in the building."

Q. Okay. Are those, are those the simulations you're talking about today?

A. Yes.

Q. Okay. So they had those as of May 7, 2016?

A. Yeah. These are the ones that I don't know if they could actually see them.

Q. You don't know one way or another?

A. I don't. Because after I sent follow-on videos, I mean they may have been able to read these, but I know recently when I started sending videos to them they were all, they, they were static. I don't know why, but it was a conversion error.

Q. But, but at the very least you had attempted to send it to them, and presumptively if they didn't go through, they would have told you on or before May 7, 2016?

A. Yeah. That's about the time line.

Q. Okay. So they've had this stuff for a while.

A. Well, let me, hold on one second. Let me see here. May 7th, yes, I think that's fair.

Q. Okay. Now, with respect to the heat simulations, are there, are there specific formulas that you used to calculate the, what the room temperature would have been?

A. Yeah. That's, that's the purpose of the, the OpenFOAM simulation software. It allows you to do a wide variety of turbulent flow, buoyancy-driven flow, heat transfer analyses. It's an entire decomposition of the diffusive heat transfer equations.

Q. So what's the formulas? What are the equations?

A. It's the heat transfer equations. It's the, it's the finite element version of the heat transfer equations as it's coded in OpenFOAM. It's a buoyancy-driven foam -- flow simulation.

Q. Okay. So this, this software provides the equation?

A. Well, the software is an implementation of a finite element solver for these equations. So what you do is you create a model of the, what you're going to simulate. And then you create boundary conditions, and then you set up a set of simulations. So in this case it was a buoyancy-driven flow.

Q. Okay. But what are those equations specifically? Do you know?

A. I can't recite them off the top of my head.

Q. Okay. Do you know what they are?

A. Yeah, they're the --

Q. If --

A. -- well, heat transfer, the --

Q. Okay.

A. Yeah.

Q. This simulator, if I were to go to open, open flow --

A. OpenFOAM.

Q. -- OpenFOAM, sorry, and put in all of the requested data for this, could I run a simulation?

A. I don't think you have the competency to do that.

Q. I would not --

A. And nothing personal.

Q. -- be insulted.

A. Right. So not, nothing personal. I don't believe that -- I mean you have to have some expertise --

Q. Why?

A. -- and that's why --

Q. What, what does it take that I don't have?

A. A lot of understanding of the heat transfer and the fluid mechanics and --

Q. What about? What about? I mean give me specifics, not just about the heat transfer.

A. You have to have an understanding of all the boundary conditions that you would define, the materials that you would define, how you would -- a major part of this is how you decompose the system into a series of grids so that you can solve it. And you would have to have an understanding of how the tools work. You would have to have a computing system that was adequately large to run the simulations.

For example, the 100-kilowatt simulation that I've been running, that actually has taken almost three weeks on a pretty powerful computer. So there's, there's a lot that goes into it, and that's why I actually, I have been doing simulations of this sort for many, many years. And, and actually we have outsourced when, in my previous company we outsourced it to other companies that did this. And when I left my company, I was very interested in looking at OpenFOAM because of the power of this tool. And it's open source. So I actually went and had training on open -- on using this tool in contrast to other tools that we have used in the past.

Q. And so it, it applies these equations that you can't tell me today what they are?

A. Yeah. They're the, they're the diffusive heat transfer equations. Do you, you want me to write out the calculus?

Q. Do, do you know it?

A. No, not off the top of my head.

Q. Okay.

A. And so.

Q. Did you rely, in preparing the data to put into this simulator, did you rely upon any written literature, publications, or otherwise?

A. Yeah. I, I relied on all of my training throughout my masters and PhD programs in convective heat transfer, fluid mechanics, turbulence simulations. Most of my graduate work was actually in those areas, and then I used and then I employed this tool. As I said before, my, my research in my PhD program was on large eddy simulations, which is a family of simulations that can be done in this tool. And so, and that's actually how --

Q. Large eddy deals with fluid, correct, not air?

A. -- it's -- what's that?

Q. Large eddies refer to fluid?

A. No. A large eddy simulation --

Q. Sure.

A. -- is a, it's a course grid scale full simulation of the Navier-Stokes equations, and it can incorporate the heat transfer equations for, on a course grid. And what you do in large eddy is you solve at a large grid, and you model at a smaller grid. So that was my research. You said we were going to get back to it, but that was my research in my PhD program.

And so a large eddy simulation is not, it, it can be used for lots of different things. You can use it for fluids. You can use this for gas. You can use it for plasmas. You can do lots of different things. In this case, we were doing it for air, the most simple case.

Q. With respect to the flow meters, sir --

A. Yes.

Q. -- did you test what the reading on the flow meter would be if the amount of water passed through it and the amount being, the amount that Penon reported went through?

A. Uh-huh.

Q. You did?

A. I'm sorry. Say that again. I'm sorry.

Q. Did at any time you test these flow meters

that you had -- and how many of them did you test?
A. **We tested two of them. We bought four of them.**
Q. Is there a reason you didn't test all four?
A. **One of them we bought was a much smaller unit that would have been more appropriately sized for this application, and we just never got to it.**
Q. Okay. What about the two that you tested? Were they the exact same unit?
A. **They were the exact same unit, yes.**
Q. Okay. And did you test them by putting through, I believe it's 1.6 cubic meters of water per hour?
A. **1.6 is the limit, right? That's the minimum.**
Q. Okay. And, and what was the plant producing?
A. **The plant was producing between 1 and 1.5. So it was below the minimum operational point for the, for the, for the unit.**
Q. 1 and 1.5? Now --
A. **Yeah, that's what I recall. So if we take -- yeah, 1.5 was 36,000. And I believe there was a number like 24,000, and that would have been 1. Assuming that the density of water --**
Q. What was the average?
A. **Across the whole test? I don't know. I**

don't think I ever --

Q. Majority of it was done at 36,000, correct?

A. Yeah. Most, most of the numbers were around 36,000 or exactly 36,000.

Q. Okay. So at 36,000 you would be talking about --

A. 1.5.

Q. -- 1.5.

A. And --

Q. Did you --

A. -- at 24 it was about 1. It is 1.

Q. Did you test the flow meters by putting through 1.5 cubic meters per hour?

A. No, we did not.

Q. Okay. So you don't know what the error rate would have been putting that amount through?

A. Well, it's not --

Q. Your test was simply to determine whether you could achieve some lower amount of water flow to fool the device?

A. No. I was not suggesting fooling the device. What I was saying is that the manufacturer has a very clear set of instructions, and in the set of instructions they indicate what, how to properly size a system. And they indicate that the, the device has to

be full, and they indicate that any measurement below 1.6 is invalid. So from that standpoint, we wanted to know what would happen if you were below. Because they're invalid measurements if you can't meet the minimum. They just don't work.

Q. Do you know, sir, the specific device that was used, the flow meter, was it certified prior to its use?

A. In the reports they indicate that there was a test report.

Q. Yeah.

A. I never saw that test report before the test, but what I did have is the PoWoGaz adapter -- I think that's the correct name -- PoWoGaz adapter type certification from their website and their manuals. And they, of course, sent that information when we bought the units too.

Q. Okay. Do you have any reason to dispute the certifications of any of the equipment that were performed prior to the test?

A. I have, I, I don't think I've ever seen the certifications before the test.

Q. Okay. The...

THE VIDEOGRAPHER: Got eight minutes.

Q. Okay. So you've never seen the

certification, sir. Do you have any reason to doubt them?

A. Well, I haven't seen them, so I wouldn't know what to comment on doubting them.

Q. Well, I'm asking you sitting here today whether you have some information that any certification would be inaccurate.

A. It would depend on what the test was and how it was done and who did it and if the, if there was control over the devices before and after and, I mean it depends on a lot of things.

Q. All right. Let me ask it this way. Have you formulated any opinion that the devices have been tampered with?

A. No, I have not.

Q. Have you formulated any opinion that the device or devices in this case have been inaccurately measuring?

A. Inaccurately measuring, so I have --

Q. Are they, are they flawed measurements?

A. I have formulated an opinion that the flow meter was improperly sized and it was operated below its minimum operating point, which is the data that was provided by Penon and also supported by the information provided by the manufacturer including the type

certificate.

Q. If the flow meter were, was certified and tested at the reported flow rate, would you have any reason to challenge that report?

A. It wholly depends on what testing was done and how it was done and by whom and what their qualifications to do the testing would be.

Q. Let me show you, sir, what we will mark as Exhibit 15.

(Whereupon, Exhibit 15 was marked for identification.)

Q. It's a composite exhibit, all there. I believe it's 15.

A. It's 15. This one is 14.

Q. Is a composite exhibit, and I'm going to ask you to turn to the document bates stamped as Penon 00000156, which purports to be a certification performed on the flow meter, the one used on this test, not a similar one or different model, but the same one, same serial number. And it was purportedly performed on March 11, 2016.

A. 156?

Q. Yes, sir, 156.

A. Okay.

Q. Okay. And it purports that where there was

1.52, which is what we decided was the average when it's --

A. **I don't remember.**

Q. -- at 36?

A. **Yeah, you --**

Q. Okay.

A. **-- you suggested that. I don't know the averages.**

Q. Well, at 36, at 36,000 --

A. **Is 1.5.**

Q. -- liters, it's 1.5. So this tested at 1.52, resulted in a error rate of 1.31 percent.

A. **I don't --**

MR. LOMAX: Objection.

A. **-- speak or read Italian, and I haven't had an opportunity to review this. And so from that standpoint, I would have to understand what the full test was. I don't know who LMV Rapporto Di Taratura is. I don't know if they're qualified. And furthermore, they are, they are calibrating a device outside of the operational range that it was manufactured and designed for. It's inconsistent with all of the instructions from the manufacturer. Do you have this same calibration in English by chance?**

Q. I do not believe we have one in English.

They --

A. **Okay.**

Q. -- happen to be an Italian company.

A. **Okay. So we probably need to have this interpreted and find out who these people are.**

Q. Likewise, if you turn to Penon 0000158.

A. **Uh-huh.**

Q. Okay. It is a second measurement of this device.

A. **Uh-huh.**

Q. Okay. And it measured between .7 cubic meters per hour and 2.5 cubic meters per hour?

MR. LOMAX: Objection.

A. **Yeah, again I --**

Q. Purportedly.

A. **I don't know. Is this maybe Italian? Maybe this is even a different language. I don't know what this is in. Is it --**

Q. Do you know what M3/H means?

A. **Yeah. What does portata mean?**

Q. Flow.

A. **That's flow?**

Q. I believe that's flow.

A. **Okay. So --**

Q. That's the best Italian I know.

A. Okay. So why, maybe you could go through and interpret all of this language for me.

Q. That I cannot do for you because I don't speak Italian.

A. Okay.

Q. Sir --

A. Is that maximum flow, minimum flow, average flow?

Q. I believe that's the tested rate.

A. Okay.

Q. But let's make that assumption for now. Okay?

A. Okay.

Q. We'll, we'll call it an assumption. We can have you check that. But at 1.5, errore, which I'm pretty sure we both can guess is error percentage --

A. Uh-huh.

Q. -- at 1.5 appears to be .3 and .4 --

MR. LOMAX: Objection.

Q. -- percent.

A. This, again I'll go back to the original discussion. Where is the test plan? Where are the test procedures? Where is the data to support this? These are numbers in Italian on a sheet of paper.

Q. That is a great question. Where is your test

plan, sir, for the test you ran?
A. **It's in our, in our archival, and it was provided to our attorneys under attorney-client privilege.**
Q. It has not been provided to me --
A. **I don't, I don't know.**
Q. -- so I can't evaluate your test either, but.
MR. LOMAX: Objection to this as argumentive. You're just making conversation instead of questions.
Q. Can I properly evaluate your test, sir, without knowing the test plan?
A. **I don't believe you can.**
Q. Okay. Can I properly assess your test, your testing without being provided the test data?
A. **I don't believe you could.**
THE VIDEOGRAPHER: One and a half minutes.
Q. Can I adequately evaluate your test data without seeing any information --
MR. LOMAX: Objection.
Q. -- regarding how it was performed, how it was run, the test data, the assumptions made, the slope, the flow rate of the water?
A. **Only to the equivalent extent as I can read Italian and interpret this.**

Q. Okay. So your answer is --

A. So the answer would be no.

Q. No.

A. Yeah.

Q. Okay. So, so you, you understand that I'm sitting here today and I'm, my hands are tied. I can't really evaluate whether what you did was proper or not?

A. Uh-huh.

Q. Sir, do you --

A. Is there, is there, do you have the, these same calibrations before the test?

Q. Yes, sir.

THE WITNESS: Can we get copy -- do we, have we, do we have copies of that?

MR. LOMAX: Were they provided in discovery?

MR. ANNESSER: I believe they had been.

MR. LOMAX: Okay. If you know the, the bates.

THE VIDEOGRAPHER: 20 seconds until the time.

Q. Sir --

A. Yeah, so we'll take an action to look those up. We would, we would definitely want to see those.

Q. Absolutely.

A. See the same calibrations before.

Q. Now, sir, just so we can move on, other than the opinions you've set forth here, do you plan on offering any other opinion testimony?

A. **Not as far as I'm aware at this point.**

Q. Are you planning on opining that there was some sort of manipulation or nefarious activities taken by Dr. Rossi or any of the other third-party Defendants in this case?

A. **Not that I, not that I would imagine at this point, no.**

Q. Have you seen any evidence of nefarious activities?

A. **Not at this point.**

Q. Okay. Is it your understanding then, sir, that in all likelihood or is it your opinion that the problems with the data are the result of a either poor test plan, well, a poor test plan?

A. **My opinion would be that the, the results are a combination of poor test plan, poor documentation, and a completely inadequate selection of the sensors used for this system.**

Q. Okay. Are you planning on opining that the test plan was not followed?

A. **Mr. Penon provided me with a test plan on the day, on February 16, 2016, trying to remember that day is correct.**

Q. Yes, sir.
A. He provided me with the test plan regarding what they were going to do that day. That was different than the information that was provided in these other test documents. So when we were there, I asked him if he could provide me a test plan, test procedure, the things that you would normally do to kind of close down a system. And he provided me a different document, so I'm not sure if the document he provided me on that day was the correct document or which document, because there were --
Q. Well --
A. -- a wide variety of them.
Q. -- there's a different plan for the close-down procedures than there is for the start-up procedure, right?
A. Well, it was different than what was presented here, so yes.
Q. How was it --
A. In fact I, in fact I didn't even see that you guys had a copy of one.
Q. How was it different?
A. He had modified it while we were standing there outside the container waiting for them. He and Mr. Fabiani were creating it. And they said that they

had e-mailed it to Mr. Darden a week or so before the test. And we called Mr. Darden to find out if he had a copy of it. Nobody could find it. They went through the e-mails. And so we asked them if they could just forward the e-mail, and they weren't able to do that, but what they were able to do was to produce another document, and that document was different.

Q. What, what was different about it?

A. Several of the details when I contrasted it with some of these documents that I had --

Q. You can't tell me what they are today?

A. Off the top of my head I cannot.

Q. Okay. Is that from the two documents? There's nothing that requires an expert opinion to tell the differences between the two documents, is there?

A. I would say that when I went through and described and looked at it, I would say there were lots of nuanced differences that it would require somebody with some expertise.

Q. Such as?

A. I don't recall off the top of my head. I, I wrote a summary, in fact, in that of a lot, one of the documents that you've provided today that was redacted, I wrote a summary of a lot of the issues that I had seen with the test plan.

Q. Okay. That has --
A. And that he provided us on that day.
Q. Okay. That hasn't been provided to us either. Now, on that day, on the 16th or 17th you took a lot of notes and measurements, did you not?
A. I did, yes.
Q. Yeah. Did you ever give those to counsel to produce to us?
A. I gave those to counsel --
MR. LOMAX: Objection. Again to the extent that there's any communications with counsel.
A. I gave those to counsel under attorney-client privilege.
Q. Really?
A. I did, yes.
Q. And, and the attorney-client privilege, do they represent you?
MR. LOMAX: Objection.
A. I was an employee of Industrial Heat at that point.
Q. Were you retained as an expert?
MR. LOMAX: Objection.
A. I'm sorry. When?
Q. Prior to the end of the test?
A. Was I retained as an expert prior to the end

of the test? No, I was --

Q. For Industrial Heat.

A. -- an employee of Industrial Heat.

Q. Okay.

A. Prior to the end of the test I was an employee of Industrial Heat.

Q. And your work there was as an employee of Industrial Heat, was it not?

A. Uh-huh.

Q. Your measurements?

A. Uh-huh.

Q. Okay. That, that was in the ordinary course of your job functions?

A. No. I was provide -- I was doing this specifically because I was requested to do it when we went down to the plant closing after Industrial Heat had engaged.

MR. LOMAX: And once, once again --

MR. ANNESSER: No, no. Hold on.

MR. LOMAX: -- I object.

MR. ANNESSER: I'm entitled to timing here.

Q. Were you asked to come down to the plant on the 16th and 17th by counsel or as part of your job?

A. I was asked to come down --

MR. LOMAX: Objection.

A. I was asked to come down by Industrial Heat under the guidance of counsel.

Q. Okay. So at that point in time, without seeing any of the things that you observed on that date, was it your understanding that they were planning on litigating with Dr. Rossi?

MR. LOMAX: Objection. Do not respond to this based on your --

MR. ANNESSER: I asked his understanding.

MR. LOMAX: No --

MR. ANNESSER: I'm entitled to understand that. Yeah, absolutely.

MR. LOMAX: That would be based on his communication with counsel.

MR. ANNESSER: Was it --

MR. LOMAX: Objection.

MR. ANNESSER: His understanding is his understanding.

MR. LOMAX: Based on --

MR. ANNESSER: I'm not asking about communications. His understanding is not privileged. Communications are.

MR. LOMAX: I'm going to instruct you, if you can provide anything outside of what you know from your communications with counsel, then you should do so. Otherwise --

MR. ANNESSER: Just because he communicates with counsel doesn't mean he doesn't have to testify to anything that he communicated about. I'm asking his understanding. I'm not asking what was discussed.

Q. And I don't want you to tell me what was discussed. I want you to tell me was it your understanding at that point in time that they were preparing for litigation with Dr. Rossi?

MR. LOMAX: Objection. If you can answer without divulging what you knew from --

MR. ANNESSER: Stop, Mr., Mr. Lomax. You are guiding the witness. Okay. I'm not asking for any communications.

BY MR. ANNESSER:

Q. You can answer with a yes or no. Was it your understanding, sir, that at that time, as of the end of the test, February 16th and 17th, 2016, that Industrial Heat was preparing for litigation with counsel -- or I'm sorry, litigation with Dr. Rossi?

A. All of my communications were with counsel at that time.

Q. All right. That was not the question, sir. Was it your understanding that, that Industrial Heat was preparing litigation with Dr. Rossi?

A. **My understanding was that the Industrial Heat group anticipated that Dr. Rossi would sue them.**

Q. Because they did not plan to pay?

MR. LOMAX: Objection. I object to this entire line of questioning.

A. **I don't, I don't have any idea about why.**

Q. Why would Dr. Rossi sue them?

A. **I have no idea. He's a litigious person? I don't know.**

Q. Is he? How many lawsuits has he filed?

MR. LOMAX: Objection. I'm...

A. **I have no idea.**

Q. Well, you just called him a litigious person?

A. **Uh-huh.**

Q. Based on what?

A. **Based on comments made to me by Tom Darden.**

Q. What comments?

A. **That he's a litigious person and we need to drive this to find out if anything is real here.**

Q. And when were those comments made?

A. **June of 2015.**

Q. So your participation in the, in coming down on the 16th and 17th of February 2016, was that in anticipation of litigation or was that in your role as the Vice President of Engineering for Industrial Heat?

MR. LOMAX: Objection.

A. So my role as, as Vice President of Industrial -- Vice President of Industrial Heat was to go and look at this test closeout. In fact, I don't even believe that I knew the test closeout was going to happen until only a few days before that.

Q. Okay.

A. Maybe a week before it.

Q. What specifically were you asked to do?

A. To observe and find out what was going on in the plant, figure out what, what was done, and observe what was happening.

Q. Now, at that time -- when did you first learn what, if anything, was on the other side of the wall at JM?

A. When was the first time that I learned? I don't know that I actually know what was on the other side of the wall. I know there was the container, but other than a steam contraption to receive steam and send condensate back, I don't know. And, and the noise that it was producing while we were there. So I think I saw some pictures maybe in the last two weeks, three weeks.

Q. What noise was it producing?

A. Oh, it was just an irritating noise when the,

when we were in the lab. It sounded like an air compressor running continuously.

Q. Do you know what that was?

A. No. It was very irritating.

MR. ANNESSER: Okay. If we can go off the record for just a moment.

THE VIDEOGRAPHER: We're off the record at 4:52 p.m.

(Recess taken 4:52 p.m. to 4:53 p.m.)

THE VIDEOGRAPHER: We are back on the record at 4:53 p.m.

BY MR. ANNESSER:

Q. Okay. Sir, I have concluded my questioning with one last question. Other than what we have discussed here today, are there any other opinions that you plan on offering in this case?

A. Not that I'm aware of at this time.

MR. ANNESSER: Okay. Thank you. Gentlemen, it's yours.

MR. LEÓN: Thank you, John.

EXAMINATION

BY MR. LEÓN:

Q. Good afternoon, Mr. Murray. My name is Francisco León. I'm not sure if you remember. We met back at the deposition of Dr. Rossi. I represent JM

Products, Inc., Henry Johnson, and James Bass. I only have a couple of questions for you. To start, did you ever meet Mr. Henry Johnson?

A. I have not.

Q. You have not. Great. Have you ever spoken with him on the phone or via e-mail?

A. I have not.

Q. Okay. Have you ever met Mr. James Bass?

A. I have not.

Q. You have not. Have you ever spoken with him via telephone or e-mail?

A. I have not.

MR. LEÓN: Okay. That's all the questions I have. Go ahead, Rudy.

THE WITNESS: That was easy. I like that.

MR. NUÑEZ: All right.

EXAMINATION

BY MR. NUÑEZ:

Q. Good afternoon, Mr. Murray. My name is Rudy Nuñez. We also met the other day at Dr. Rossi's deposition. Can you hear me clearly through the speakerphone?

A. Yes.

Q. All right. You let me know if you have any problems or trouble hearing. Okay?

A. Okay.

Q. All right. As you testified, you know, several times today, you brought up Mr. Fabiani. I represent Fulvio Fabiani and his company, an LLC by the name of United States Quantum Leap. I certainly don't have the time to go back through all that you've done that I would want to, but I did want to, you know, touch on a few points to kind of maybe clear up some questions I had.

Let me ask you. When, when you first came on board with Industrial Heat with regards to Dr. Rossi's technology, E-Cat, and the plant, what were you told at the start about Mr. Fabiani?

A. I was told that Fulvio Fabiani was a close family friend of Mr. Rossi's wife. I, I believe her name is Maddalena, and that she was, you know, a close, almost like a mentor of his, and that Fulvio had worked with, with Mr. Rossi in Italy and on other activities. I also learned that he was a, an avid pinball machine both repairman and developer.

Q. Anything else?

A. Other than he had developed some hardware devices for the, the reactor system. And I don't, I don't remember the exact nature of that. And that he had spent a lot of time in, in Raleigh.

Q. What were you told about his work performance, if anything?

A. That he, you know, he showed up, but you know, he was just kind of a participant in the data collection and, at the plant. He was kind of like Dr. -- or Mr. Rossi's kind of assistant, if you will, or technical assistant, kind of helping him out in the facility.

Q. Did anyone make any comments to you or talk to you about any concerns they had with him?

A. I think there was, there was a, a modest level of concern with how close he was with Mr. Rossi relative to just, you know, the close relationship and whether or not he would be fully -- fully disclose everything to us, but I think the only thing that he hasn't disclosed as far as I'm aware is the actual final report and, and I think maybe he has produced some data. I haven't looked at it though. So it was only a question of if he would release all of the data.

Q. So to your understanding, the only thing he didn't do was turn over that final report?

A. I believe that's, that's correct, yes.

Q. And I think the raw data too. I don't want to, you know, I'm not trying to trip you up or anything.

A. Right, no, no, no. Yeah, I think the raw

data, he indicated that there was raw data stored on a server in Russia that was encrypted and he had to, he put it there for safekeeping, and I believe that that data has been released only maybe in the last few days. I, I have not looked at it. I haven't seen it. I haven't inspected it, but I believe that it has been released in the last few days. But I have not seen a final report, and I don't know anything about, you know, if a final report was actually produced.

Q. All right. Now, getting back to, I was asking you about conversations and concerns. And again I don't want to put words in your mouth, but correct me if I'm wrong that it seemed like you had heard that there may be concerns about what he was, how honest he was being with Industrial Heat. Is that a fair way to phrase it?

A. I would say that the concern was about his allegiance and his close relationship with Mr. Rossi rather than -- that's how I would characterize it.

Q. Okay. And do you think, was that something that was knew over time or would they knew that from the beginning?

A. I --

Q. I should say -- let me strike that.

Was that a new concern or a concern that they may have had all the way going back to the beginning?

A. I really couldn't say. I only know kind of from when I kind of started to work on this aspect in June of 2015.

Q. And so we've been talking about conversations and what you were learning from Industrial Heat. And who were you talking to about Fulvio Fabiani? Who were the conversations with?

A. JT Vaughn, T. Barker Dameron, maybe Tom Darden to some extent. I don't really recall, but those general people.

Q. Do you recall ever being told that there was a suspicion that Mr. Fabiani was overheating some of the equipment, maybe the reactors -- I'm not really technically savvy -- but was he maybe doing something on purpose to frustrate the test in North Carolina at any time?

A. I have never heard anything about that.

Q. Now, tell me, how many times did you meet Mr. Fabiani?

A. I think I have met him on two occasions. I believe, well, I'm, I'm certain I met him on the 16th and 17th of February 2016. And then I met him again maybe in March, I don't remember the exact time line, at the offices of Jones Day, in the March or April time

frame. I don't remember the exact date. And I don't believe other than that, you know, he sent text messages to me.

He was, he wanted to arrange to deliver the data and to get his check, and I offered to hand carry the check to him if he would give us the final report and the data. I think I, on at least two or three occasions by text message, we had exchanged text messages and, and maybe it was e-mail or text messages. I don't recall.

Q. Okay. So, so some, some written communication, either text message or e-mail, and potentially two times that you met him in person; is that right?

A. Yes.

Q. All right. The first time you were telling me, February 15th, I think it was February 15th or 16th?

A. No. I think it's February 16th and 17th.

Q. Okay. And that was down at the Doral facility?

A. Yes, it was.

Q. And did you have any occasion to discuss anything with him or have a conversation with him at that time?

A. Yeah. He indicated that, you know, he was

familiar with my background working with the Department of Defense. And he, he indicated that he had worked in, on some Israeli imaging video surveillance programs. And, you know, we had just what I would describe as chitchat, perfectly pleasant discussions. I think that was on, probably on the 16th. And then I think the 17th was a little bit more chaotic because a lot of stuff was being pulled out and, and I think they had to race to get Mr. Penon to the, to the airport. I don't remember the exact sequence of events, but I would say I chitchatted with him.

And I came to find out, well, it might have been later in March when, you know, he told me about his, kind of this side business where he was I think building and maybe collecting pinball machines and things of that sort.

THE VIDEOGRAPHER: Mr. Nuñez, you have 10 minutes left on seven hours.

MR. NUÑEZ: I'm sorry. What was that?

THE VIDEOGRAPHER: You have 10 minutes left on the 7-hour time limit.

MR. NUÑEZ: Wow, I thought I still had, I clocked in 30 minutes when Francisco started. I, I still got, by my clock, another 20 minutes.

THE VIDEOGRAPHER: I'm sorry, but

Mr. Annesser went over by about 9 minutes, 8 or 9 minutes.

BY MR. NUÑEZ:

Q. Okay. Going back to that February meeting, those two dates, did you have any discussions with him about the plant or his work with Dr. Rossi?

A. I think between the two meetings, and I don't know which meeting, I'm sure that we did talk about working in the plant and with, with Mr. Rossi, yes. But I don't know --

Q. All right.

A. -- if it was on the 15th or, I don't know if it was on the 16th and 17th or if it was at the March/April meeting. I, I don't recall which.

Q. And do you have any specific recollections about your conversation?

A. You know, just that the -- and actually I'm, I'm pretty confident that this was at the March meeting, was that he, he felt like, you know, he was under a lot of scrutiny and, and, you know, that working for Mr. Rossi was a pretty tough environment, you know. There were a lot of monitoring and, you know, keeping an eye on him and things of that sort.

Q. You made a comment earlier between a hammer and an anvil?

A. Yes, yes.
Q. That was a phrase that you used?
A. I, I think that that was, I think that was the one that he put in an e-mail back to me when we were talking about how to get the data and get me down to just deliver a check to him.
Q. Oh, I gotcha. I think you may have made a comment that Barry West told you that Mr. Fabiani threatened Barry?
A. Yeah. That's what, that's what Mr. West said at the Swansboro meeting. I was kind of taken aback by that, and so I actually carefully annotated that and put that into my notes. Because I really felt like if there was a, if there was any kind of a threat like that, then we just need to get people out of there. And so I did report that up through Industrial Heat.
Q. And can you tell me about the threat? How was that, what was it that Mr. West told you specifically?
A. He just said that, you know, he, the comment -- and this again, this is almost, you know, it was a year and a half, maybe approaching two years ago. The comment was something to the effect that Barry told me -- or, I'm sorry. Fulvio told me that if I screwed up anything related to the plant, he'd kill me. You

know, and I don't know if that's a, an in-passing comment or if it's a -- you know, you just never know because of the context. It's just you don't want to have a, a physical altercation or some kind of an issue come up. And my view was just get people out of there if that's the situation. Maybe it was a highly stressful environment. I don't, I don't really know.

Q. Had there been a language barrier issue?

MR. LOMAX: Objection.

A. I wouldn't, I wouldn't know.

Q. Did Barry ever make any comments to you that he had a problem communicating with Mr. Fabiani due to Italian being his primary language?

A. He didn't, he didn't indicate that. In fact, he indicated that they were kind of, you know, buds and they would go out to the bar and go drinking and go to different things. Get, maybe go, I think he even described going fishing at some point. So I don't know. It was just kind of one of those weird comments that Barry made that, you know, I just felt a responsibility to note it and put it on the record, you know, in case there was anything that was, you know, that happened. I wanted to make sure that people were just aware that that comment was made.

Q. Did Barry make any more comments? Did he,

for instance, did he say that he was scared of Fulvio?
A. **The, he certainly suggested that he was intimidated by him, yes.**
Q. And when you say suggested, what, what do you mean by that?
A. **You know, the tone of how he made the comment and was looking at us. You know, we were literally sitting at a table having some lunch, and he kind of gave that, that suggestion that, yeah, he's kind of intimidating. You know, like kind of when you look at people, like he was, when he made that comment to me, he was a little bit taken aback when, you know, kind of in those situations. That, that's how I would characterize it.**
Q. Okay. All right. Let's move on. I'm running out of time. Let me ask you. Your work assisting Industrial Heat in this litigation, have you spoken to people over at Industrial Heat about Mr. Fabiani's contract?
A. **You mean recently or?**
Q. Well, let me, let me strike that.
Are you familiar that, whether or not Mr. Fabiani had a contract with Industrial Heat?
A. **I was, I was not familiar with the details of a contract, but I do know that at some point there, a**

contract had expired and JT Vaughn just kind of continued to pay him on a, what I would describe as kind of month-by-month basis rather than renewing a contract. I don't know the specific dates, but I remember that was a discussion topic.

Q. And I think you, you testified that you, in your testimony with regard to his role and, and what his duties were. Would you agree that Mr. Fabiani's primary role and duties was to assist Dr. Rossi in his work?

A. I would agree with that, yes. I think he was kind of like arms and legs, or I may have called him like a, kind of a technician type of a person, helping him and, you know, helping fix stuff and repair stuff and working with Mr. Rossi throughout the test period.

Q. All right. Let's, let's move to that meeting in March. And I take it that's the meeting that you had and others with Mr. Fabiani at the offices at Jones Day?

A. Yes. I don't know if it was March or April, but it was thereabouts in that kind of time frame.

Q. Okay. Who was there at that meeting?

A. I was there, JT Vaughn was there, and Chris Pace was there.

Q. And that's it? The three of you and Mr. Fabiani?

A. I believe so.

THE WITNESS: Chris, you weren't there, were you?

A. No. I think it was --

MR. LOMAX: I guess I, I can't answer, but.

A. Yeah, I'm sorry. I'm sorry. Yeah, I believe, to the best of my recollection it was just the three of us.

Q. Were, were any, was anything offered to Mr. Fabiani for him to turn over the remaining report and data that he ended up claiming was due?

A. Well, Mr. Fabiani actually offered up, he said, look, I'm writing this final report and I have all this data. And I don't mean the specific details, but he said we sampled data for specific things, I don't know if it was every 10 seconds or 5 seconds, throughout the entire test period using his system.

And he said he was completing a final report for Industrial Heat. And we said, great. And I believe that there was even a discussion of potentially trying to have him help with other aspects, but I don't recall the, the details of that. My, really I was interested in the data and interested in the final report to find out what was going on, because I had hadn't seen any details of how all this stuff was collected and pulled together.

Q. Was there any offer made to Mr. Fabiani for an extension of continuing to do work for Industrial Heat?

A. I think --

MR. LOMAX: Objection.

A. Okay. I, I think there was, but I can't recall specifically.

MR. ANNESSER: One and a half minutes, Rudy.

Q. And what were you told about the purpose of that meeting with Mr. Fabiani?

MR. LOMAX: Objection to the extent it's about communications with counsel. Otherwise you can answer.

A. Okay. I was --

Q. What was that?

A. I'm sorry.

MR. LOMAX: Could you hear me Rudy?

MR. NUÑEZ: Yeah.

Q. I was going to say I don't want to hear what the attorneys told you. I want to hear what Mr. Vaughn or Mr. Darden told you or Mr. Dameron, whoever else was there.

A. Yeah, well, it was just JT and I. What was your question? The purpose of the meeting?

Q. Well, yeah. Let me clear that up. You know, what were you told either before or, you know, at the meeting by the Industrial Heat people of the purpose of that meeting with Mr. Fabiani?

A. This is my recollection going back to that time, but my recollection was that Fulvio had this data. We had requested data. And so we were going to meet with him to find out how we get a copy of the data and then pay him the final payment that was offer -- you know, that was due him. And so we actually went down there with the intention of, of doing that.

And so, and I, I don't recall if on the first day he didn't have the data and then he went and he got the data, some of the data, the spreadsheets on the next day. And then he said he would deliver the final report and some of the other, the, the final report and the raw data, you know, within the next few days. And we said, great, and then we'll just pay you for the final, you know, payment due.

Q. And who set up that meeting? Who, who scheduled it or, do you know?

A. I suspect JT Vaughn, but I, I don't, I don't recall.

Q. And I think your testimony was at that meeting that Mr. Fabiani came with spreadsheets and documents to turn over?

A. Well, the, the next day. He came back with just spreadsheets. Sorry.

MR. LOMAX: Rudy, do you have one more question? The time is up, but I, you know --

MR. NUÑEZ: Well, here's the thing, guys. I mean I'm not there, but I marked my watch when the court reporter said 31 minutes. I think John had one question. Francisco made two questions. I still have, I mean by my calculation, I've got like 7 minutes left. You know, time does not work differently down here, and I marked it when the court reporter said 31 minutes. So I'm not sure how I've lost these 8 minutes because John did not take up 8 minutes asking questions.

MR. LOMAX: Well, the court reporter --

MR. NUÑEZ: We can go back to the video or we can go back to something. I got a couple more questions left. I don't think I have 10 minutes, but I marked my watch when the court reporter said 31 minutes.

MR. LOMAX: Well, you know, Rudy, this is Chris. I would, I would be willing to extend 5, 5 more minutes. The court reporter is telling us that the time is up.

THE WITNESS: So let's go. If you have a

couple more questions, go ahead, Rudy, quickly.

MR. NUÑEZ: Yeah. I don't have that much, so I appreciate it, Mr. Murray.

BY MR. NUÑEZ:

Q. And I'll move on from the meeting at Jones Day. Let's go to the -- and I think it's in your expert report. You've been asked a lot about it. I'm not trying to retread all this stuff, but I do want to confirm a couple things just to clear up with my questions.

There were -- and correct me if I'm wrong. Mr. Fabiani provided what I would call, and you correct me, electric power consumption numbers; is that correct?

A. He provided us with, I think it was a spreadsheet for each month or maybe it was one spreadsheet that had numerous tabs. I don't recall which. And it had the time stamp for twice a day, cumulative energy in those 12-hour periods. And he provided us with a, a log that kind of showed dates and events when things were turned on and the power went off and this and that and different events, so what I would describe as a log of events.

And I think those were the two major items that he had provided to us on the second day, and then he was going to wait and provide us with the final

report and the other data a few days later. He also said that he had taken data from the flow meter from time to time, and he had logged it into a spreadsheet on the desktop of his computer, but his computer was locked up and he couldn't get to it, and he was going to provide that data to us as well, but he didn't produce that data either.

Q. Okay. And now my question relates -- I think you made an analysis that his power consumption numbers for the plant don't match the readings from Florida Power and Light; is that correct?

A. No, which just incidentally we would not anticipate that they match. We would anticipate that the building would absorb more power than just the reactor because there was other, there were other electrical devices in the building. The primary concern is where the value goes negative, where the building is actually absorbing less, less energy per day than the, than reported by Mr. Fabiani and Mr. Penon.

Q. Okay. And how many times did that happen?

A. How many times? There was a 14-day period. I think cumulative number of days where it was below zero was 14 days, and that's just pure absolute negative. And, you know, and that's just assuming that nothing else in the building absorbed power.

Q. Okay. So that was 14 out of, I think it was 350 or almost a year, correct?

A. I believe the number in the final report was total of 357 days, and then Mr. Penon deducted 5 or 6 days. I don't remember the exact number. And so there was a cumulative number of maybe 352 days of, of operational days.

Q. And for lack of a better word, I think there were discrepancies between Fabiani's numbers versus the FP&L's numbers. Do you have any reason to believe that that is a result of Mr. Fabiani manipulating the data that he was putting into his spreadsheets?

A. At this point, I have no evidence of that whatsoever.

Q. And do you anticipate any kind of work in the future between now and trial where you would come to a different conclusion?

A. I can't say at this point because I think that there's a lot of data that's just becoming available. For example, I think the raw data from Mr. Fabiani just became available, and I have not looked at that at all.

Q. Okay. Let me ask you, and this will --

MR. LOMAX: And Rudy --

Q. I'm close to the end here.

MR. LOMAX: This is Chris and --

Q. Do you have any evidence --

MR. LOMAX: -- time is up.

Q. -- in your investigation and your work for Industrial Heat that Mr. Fabiani manipulated improperly any data?

A. At this point, no, I do not.

MR. LOMAX: And, Rudy, this is Chris. That's the time.

MR. NUÑEZ: All right. And, yep, that's going to match up with my time. And I will say thank you, Mr. Murray. Thank you, everyone. Have a good weekend.

THE WITNESS: Okay. No problem. Thank you, guys.

THE VIDEOGRAPHER: This concludes the videotaped deposition of Joseph Murray. We are off the record at 5:20 p.m.

(Stenotype record continued off the video record.)

MR. ANNESSER: Just as a formality, sir, you have the right to read or waive, which means you can read the deposition before it's finalized, or you can waive that right.

THE WITNESS: I would like to read it.

MR. ANNESSER: Okay.

MR. LOMAX: And Defendants are going to designate Mr. Murray's testimony at this time as highly confidential due to a lot of the information that was provided here today.

(DEPOSITION CONCLUDED AT 5:20 P.M.)

(SIGNATURE RESERVED)

STATE OF NORTH CAROLINA
COUNTY OF WAKE:

REPORTER'S CERTIFICATE

I, LAUREN McINTEE, RPR, a Notary Public in and for the State of North Carolina, do hereby certify that there came before me on Friday, the 17th day of February, 2017, the person hereinbefore named, who was by me duly sworn to testify to the truth and nothing but the truth of his knowledge concerning the matters in controversy in this cause; that the witness was thereupon examined under oath, the examination reduced to typewriting under my direction, and the deposition is a true record of the testimony given by the witness.

I further certify that I am neither attorney or counsel for, nor related to or employed by, any attorney or counsel employed by the parties hereto or financially interested in the action.

IN WITNESS WHEREOF, I have hereto set my hand, this the 20th day of February, 2017.

Lauren M. McIntee

LAUREN McINTEE, RPR, Notary Public
Notary Number: 201616600044

WITNESS'S CERTIFICATE

I, JOSEPH ALAN MURRAY, do hereby certify that I have read and understand the foregoing transcript and believe it to be a true, accurate, and complete transcript of my testimony, subject to the attached list of changes, if any.

____
JOSEPH ALAN MURRAY

This deposition was signed in my presence by

_____________________, on the _____ day of

_____________________, 2017.

____
Notary Public

My commission expires:

CaseWorks, Inc.
811 Ninth Street, Suite 260 (Page 1 of 2)
Durham, North Carolina 27705

E R R A T A S H E E T

Re: Andrea Rossi, et al. vs. Thomas Darden, et al.
Deposition of: JOSEPH ALAN MURRAY

Please read this transcript with care, and if you find any corrections or changes you wish made, list them by page and line number below. DO NOT WRITE IN THE TRANSCRIPT ITSELF. Return the Certificate and Errata Sheet to this office after it is signed. We would appreciate your prompt attention to this matter.

To assist you in making any such corrections, please use the form below. If supplemental or additional pages are necessary, please furnish same and attach them to the errata sheet.

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IN THE UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

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ANDREA ROSSI AND LEONARDO CORPORATION, :
:
Plaintiffs, :
:
vs. : Case No.
: 1:16-CV-21199-CMA
THOMAS DARDEN, ET AL., :
:
Defendants. :

\- - -

CONFIDENTIAL VIDEOTAPED DEPOSITION OF
RICK A. SMITH, P.E.

\- - -

February 27, 2017
8:51 a.m.
VERITEXT LEGAL COURT REPORTING
41 South High Street
Suite 210
Columbus, OH 43215

\- - -

Reported by: Tracy J. Schell

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EXHIBIT "D"

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- - -

ALSO PRESENT:

Richard D. Stevens, Videographer

- - -

Monday Morning Session
February 27, 2017
8:51 a.m.

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STIPULATIONS

\- - -

It is stipulated by and between counsel for the respective parties herein that this deposition of RICK A. SMITH, P.E., a Witness herein, called by the Plaintiffs under the statute, may be taken at this time and reduced to writing in stenotypy by the Notary, whose notes may thereafter be transcribed out of the presence of the witness; and that proof of the official character and qualifications of the Notary is waived.

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I N D E X

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EXHIBIT	DESCRIPTION	PAGE
Exhibit 11	E-Cat MW1 Energy Plant In Miami, Energy Multiple Evaluation, Final Report	199
Exhibit 12	Pipe Steam Carrying Capacity Spreadsheet	274
Exhibit 13	Power Readings	322
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THE VIDEOGRAPHER: We're on the record. Please note -- notice that the microphones are sensitive and may pick up whispering and private conversations. Please turn off all cell phones and place them away from the microphones as they can interfere with the deposition audio. Recording will continue until all parties agree to go off the record.

My name is Richard D. Stevens, representing Veritext. The date today is February 27, 2017. The time is approximately 0851.

This deposition is being held at Veritext, located at 41 South High Street, Suite 210, Columbus, Ohio 43215. It's being taken by counsel for the plaintiff. The caption of this case is Andrea Rossi, et al. versus Thomas Darden, et al. This case is being held in the United States District Court, Southern District of Florida, Case No. 1:16-CV-21199. The name of the witness is Rick A. Smith, P.E.

At this time, the attorneys present in the room will identify themselves and the parties they represent.

MR. ANNESSER: John Annesser on behalf of the plaintiffs, Dr. Andrea Rossi and Leonardo Corporation.

MR. LOMAX: Christopher Lomax on behalf of the defendants, Thomas Darden, John T. Vaughn, Cherokee

Investment Partners, LLC, Industrial Heat and IPH International BV.

THE VIDEOGRAPHER: Our court reporter, Tracy J. Schell, representing Veritext, will swear in the witness and we can proceed.

- - -

P R O C E E D I N G S

- - -

RICK A. SMITH, P.E.

being by me first duly sworn, as hereinafter certified, testifies and says as follows:

EXAMINATION

BY MR. ANNESSER:

Q. Good morning, sir. As I just said, my name is John Annesser, and I represent the plaintiffs in this matter.

Can I ask you to please state your full name for the record?

A. Yes. It's Rick, R-I-C-K, A. Smith, S-M-I-T-H.

Q. What does the A stand for?

A. A.

Q. Just A?

A. That's it.

Q. No middle name?

A. No, sir.
Q. What is your home address, please?
A. 7400 Brown Road, Ostrander, O-S-T-R-A-N-D-E-R, Ohio 43061.
Q. And your business address, sir?
A. Is the same, second floor.
Q. You work out of your home?
A. I do.
Q. Okay. Who's your current employer?
A. Applied Thermal Engineering, Inc.

- - -

(Deposition Exhibit 1 marked.)

- - -

Q. Sir, I'm going to show you what I have marked as Exhibit 1. I apologize, I don't have any copies, so I'll hand that to counsel first.
Sir, have you seen this document before?
A. Yes, I have. Hold on one second. Yeah, it looks like the subpoena for my appearance here today.
Q. Okay.
A. Yes, sir.
Q. And have you reviewed that document prior to today?
A. Yes, sir.
Q. That document requests you bring certain

documents with you.
Have you brought those with you today?
A. I have.
Q. Now, specifically within Exhibit 1 -- let me ask it this way: Are there any documents identified in Exhibit 1 that you did not bring with you today?
A. I went through this a couple times, and to the best of my knowledge, I think I'm in full compliance with this. I mean, I may have inadvertently left something off, but I did try to be 100 percent compliant with it, sir.
Q. Did you instruct anyone to prepare objections on your behalf to the requests contained within Exhibit 1?
A. No.
Q. So you're unaware of any objections that have been asserted on your behalf?
A. No, sir, I'm not. I am unaware, that's correct.
\- - -
(Deposition Exhibit 2 marked.)
\- - -
Q. I'm going to show you, sir, what I will mark as Exhibit Number 2.
Have you seen this document before, sir?

A. Not until just now, no, sir.
Q. Okay. I'm not going to ask you to read the whole thing.
A. Thank you.
Q. But I will ask you, has anyone instructed you to bring certain documents pursuant to any objections that have been made?
A. No, sir.
Q. Okay. Thank you.
Have you ever had your deposition taken before, sir?
A. Yes, sir, I have.
Q. How many times?
A. Six.
Q. And on what occasions were your deposition taken? Well, let me ask you this way: Within the last ten years, how many times have you been deposed?
A. Well, if I may, what I've done is in anticipating these questions, I've come up with kind of a cheat sheet, if you will, just a summary of what I've done, if that would be helpful in expediting things.
Q. Okay.
A. I will give you one first. I brought a whole lot of copies not knowing how many attorneys would be here.

So in the last ten years, I don't know. In total, I've had 21 depositions. Today will be number 22.

Q. Okay. So you've testified. Is that in court?

A. You said testimony. Yes, sir, six times, correct.

Q. So it says down at the bottom, total ATE engagements?

A. Yeah, that's the total -- the number of jobs I've had since I started in the business.

\- - -

(Deposition Exhibit 3 marked.)

\- - -

Q. Okay. Well, let me ask you about that. I'm going to mark this document as Exhibit 3 for the record.

Do you have a copy in front of you, sir?

A. I do, yes.

Q. Okay. I'd like to mark the one that you're referring to --

A. Absolutely. I'll give you the original.

Q. -- just to keep the record straight. Thank you.

So you have testified in court six times?

A. Correct.

Q. When is the last time you gave testimony in court?

A. Okay. Hold that thought for a moment. Let's see here. Unfortunately, I'm looking now at my databases, I've neglected to update some of the testimony dates, but I believe -- I believe it was two years ago -- I'm sorry. Here we go. Yeah, okay, I see what I did. Never mind. Hold that thought for a moment.

Okay. That would be on the 25th of October, 2013.

Q. That's the last time you gave courtroom testimony?

A. Yes, sir.

Q. Okay. When was the last time you gave deposition testimony?

A. Okay.

Q. You can tell me roughly. I don't need the exact date.

A. I think it was about -- I think it was about the same time frame. I believe you only requested the last four years for this, at least that's what I was told.

Oh, I'm sorry, my last dep, no, my bad, it was April 30, 2015. It actually was in this building, but not here.

Q. 2015?

A. Yes, sir. Yeah.

Q. What was the nature of that case?

A. That was a boiler case. The title of it was Young versus FirstEnergy. And a gentleman was working inside a large deaerator in a power plant up in Conesville, Ohio, and some hot water burped into the tank when he was working in it, aggravated a medical condition he had.

So the issue was, was this vessel properly isolated for people to be working inside it.

Q. Does that -- does the subject matter of your testimony in that case have anything to do with your testimony in this case; are there similarities that you would draw to?

A. No.

Q. Sir, have you ever been found by a court of competent jurisdiction to be an expert?

A. Yes.

Q. And what court is that?

A. Well, obviously the courts where I've testified. Let's see, one in Alaska; Delaware, Ohio. Let's see, one was in Akron.

Q. Is that Delaware and Ohio?
A. No. The City of Delaware, Ohio. About 20 miles due north of here. Go straight up High Street.
Let's see, Fairbanks, Alaska, I mentioned that. Saskatoon, Canada. And I'm drawing a blank on the other ones.
But I have been qualified as an expert in several jurisdictions, yes, sir.
Q. Have you ever been qualified as an expert in the federal court?
A. This is the first -- this is the first time, I believe, in a federal issue like this, yes.
Q. Now, have you ever been offered as an expert in a federal court before?
A. Not that I recall, no, sir.
Q. Sir, were you ever offered as an expert in a case titled Bowe, B-O-W-E v. Conrail.
A. Yes, I was.
Q. Okay. And that was --
A. Mr. Hackman.
Q. Were you offered as an expert in that case?
A. I was.
Q. Sir, isn't it true that you were denied as an expert by the court pursuant to the Daubert standard?
A. I was not aware of that up until now. I know

there were some issues with that case that I found out in questioning in other depositions. I did not know that I was Dauberted in that case. So, no, that's news to me.

Q. Did you ever testify in that case, sir?

A. I did give a deposition, yes, I did, but I did not testify in court.

Q. And you never asked why?

A. No.

Q. Are there any other courts, sir, that have found that you did not satisfy the Daubert standards or any other expert standard --

A. I do have a --

MR. LOMAX: Objection to the form of the question.

Q. -- that you're aware about?

A. I did have a Daubert challenge in a case in Oklahoma City. And my understanding is the challenge was that the attorney that I was working for did not give me enough information to make a proper judgment.

And interesting -- oh, I'm sorry, go ahead.

Q. I'm sorry. What was the name of that case?

A. Oh, I don't remember, but it was in Oklahoma City.

Q. When was it, sir?

A. Seven years ago time frame.
Q. Is there any way that I could find that information?
A. Yeah. The -- I'm pretty sure the attorney that did the Daubert challenge was a guy named Steve McLaughlin. He's in White Plains, New York. I forget the name of the firm. But I've actually worked for him on occasion, too, so -- but I forget the name of his firm. It was kind of hard names to remember.
Q. Is there a reason that case was not disclosed as part of your expert witness report?
A. I don't follow your question.
Q. Is there a reason you did not disclose that as a case in which you --
A. Outside the time frame.
Q. What time frame?
A. I understand I had a four-year window of disclosure.
Q. Who gave you that understanding?
A. In looking through the -- well, maybe it was Ms. Handleman [sic] who said they're looking for the last four years. And I think in looking through the subpoena, it might have been the last six. It might have been Tim, but I tried -- I did try to comply with the subpoena.

Q. And are you aware, sir, that in that case, you were not accepted under the Daubert standard as an expert witness?

A. No, I'm not aware of that either. This is news to me this morning.

Q. Are there any other cases, sir, which you've --

A. In fact -- in fact, I was told that I did survive the Daubert challenge.

Q. Who told you that?

A. I believe it was the counselor I was working for.

Q. Did you ever testify in that case?

A. In a deposition. No testimony. I believe that case did settle out of court.

Q. Has there been any other court or arbitration panel that has found that you did not satisfy the standards either pursuant to Daubert or any other standard that you're aware about for expert witnesses?

A. Not that I'm aware of.

Q. How many times, sir, have you been retained as an expert witness?

A. Roughly 85. I'm sorry. 82. My bad. 82.

Q. How long have you been working with the legal industry as an expert?

A. Since the 1989, 1990 time frame.
Q. Sir, I'd like to ask you about your current employment.
You said you were with Applied Thermal Engineering, Inc.?
A. Correct.
Q. Okay. Who owns that company?
A. I do.
Q. How many employees does Applied Thermal Engineering, Inc., have?
A. Two.
Q. Who are the employees?
A. Myself and my wife.
Q. Is your wife a licensed engineer?
A. No. She does -- she handles a lot of the administrative work, marketing, sales, the insurance, all the administrative stuff.
Q. What is the nature of the business of Applied Thermal Engineering, Inc.?
A. It is an engineering consulting business.
Q. And what does the company do under the -- under the heading of engineering consultant?
A. We're primarily a power plant and utility, industrial power plants, industrial utilities. And when I'm doing consulting work, I do some design --

assist other engineering companies with design work. Obviously I do expert witness work. I do a fair amount of teaching. I do boiler and steam system surveys. And then I do P.E. certifications for boilers, hot oil boilers that go on vessels that the Coast Guard has to certify.

Q. What percentage of the work done by Applied Thermal Engineering, Inc., relates to expert testimony in lawsuits or other cases within the legal practice?

A. If you do the math, 82 in the 427 is about one-fifth numerically.

Q. Now, that's since the inception of Applied Thermal Engineering?

A. Yes, sir.

Q. Okay. Do you mind if I call it ATE just for short?

A. Please do.

Q. Okay. What about within the last year? In the last year, what percentage of your work has been in relation to expert --

A. Very little. Last year was one of the worst years I've had. I think I only had one case come in at the very beginning of the year. I doubt if it's going to go anywhere. I did a site visit in Fort Wayne and talked to the attorney sometime in the fall and she doesn't think it's going to go anywhere, so that was it.

And now this year, though, the phone started ringing. I picked up this case obviously late last year. Well, I've signed the documents early this year. And I've got what? I've got two pending and then another one. So I think I've picked up like four, maybe five cases already this year.

So it's very, very sporadic. Some years, very, very little. Other years, a lot.

Q. Okay. So of your work this year, being 2017, what percentage of your work is relating to you giving expert testimony?

A. Right now I'd say it's in the three-quarters to 80 percent range right now.

Q. What percentage of your work is relating this year to boiler surveys?

A. Nothing yet.

Q. Okay. And what percentage of your work this year is assisting with design work for other engineering firms?

A. Most of the balance. I have an ongoing project in Texas, and there's another one coming up in Texas that will start later in the week, so that's most of the balance.

Q. Okay. And what about the percentage of your work this year that deals with P.E. certifications?

A. Oh, that now, let's see, I've done two this year, so I don't know what the percentage would be. I finished one. I've got one on my desk that I need to do tomorrow.

Q. What percentage of your income is derived from -- this year, from the work that you've done as an expert witness?

A. Well, I -- actually zero, because I haven't done any invoicing this year at all yet, so -- and that number, the income number is also as sporadic as the number of actual engagements.

Q. Is there a reason you haven't invoiced yet?

A. Just haven't gotten to it. I've been very, very busy.

Q. Doesn't your wife do those things for you?

A. No. I do the invoicing. She and I have different standards on math and things like that. I'm a little more punctilious about it than she is. Okay, a lot.

Q. We may have to remove that from the record.

Sir, have you been affiliated, prior to your engagement in this case, with any of the parties to this case?

A. No, sir.
Q. Who first contacted you with respect to this case?
A. Mr. Bell.
Q. And who is Mr. Bell?
A. Bernie Bell. He's now with Miller Friel. He was with Jones Day at the time he contacted me.
Q. And before we get into that, what is your job title and job duties at ATE?
A. I am the president and basically I run the company. I do all the engineering, all the technical work, I do the billing and the invoicing and paying the bills and such, so --
Q. Do you report to anyone?
A. No.
Q. Other than your wife?
A. No, sir.
Q. Does anyone report to you?
A. She does, in a manner of speaking.
Q. Now, when you're working on cases other than expert witness-type engagements such as the consulting you do with respect to design work, what do you charge your hourly rate at?
A. Normally I'm at 275 to -- 250 to 275 for discovery work. In this case, it's 275 portal to

portal. With depositions, it's 375 an hour with a four-hour minimum. $5,000 retainer. And then expenses I just pass through.

Q. Okay. But my question was specifically other than expert --

A. Oh, I mis- --

Q. -- when you act, for example, to assist other engineers with design work.

A. Oh, my bad. I misunderstood your question.

With -- with it being the utilities, I bill them at a hundred an hour.

Q. What about P.E. certifications?

A. That's a flat rate of a thousand dollars per certification.

Q. How long does a certification like that take?

A. I've got it to the point now where I can knock one out in a couple hours. I've automated it.

Q. What about for -- let me ask you, why such a difference between $100 an hour that you charge for assisting in design work and the 250 to 275 you charge for discovery or 375 for testimony?

A. It's just a free market system. If attorneys are willing to pay that, I'm willing to charge it. If I could get more, I would.

Q. Have you ever accepted less?

A. In the earlier years, yes. You know, my rates have obviously moved up with time and inflation.
Q. Do you have any document retention policies at ATE with respect to matters in litigation in which you've been approached as an expert witness?
A. Typically, all -- all of my documents, after ten years, I discard them.
Q. Okay. Do you maintain the documents that you receive through the course of the litigation?
A. No. Again, after ten years, everything goes.
Q. I'm asking you through the course of the litigation, while the litigation is pending, do you maintain all of the documents that you've received from other witnesses, counsel or otherwise?
A. Oh, yes.
Q. So you brought your entire file with you today?
A. Yes. Now, it's not the -- like the travel invoices and things like that that are not germane, and the technical issues, those are sitting at home in a file. Other than that, everything should be here.
Q. Sir, are you a member of any professional organizations?
A. I am.
Q. What organizations?

A. ASME, American Society of Mechanical Engineers, and NFPA, National Fire Protection Association.

Q. Okay. Now, as for the ASME, what do you need to do to become a member of that organization?

A. I think they'll let, you know, a lot of people, almost anybody in as like an associate member. But to be a regular member, you have to be a mechanical engineer, which I am.

Q. So as long as you're a mechanical engineer, you're given admittance as a member?

A. As long as you pay the money, yes.

Q. Of course. The world does not spin without money.

What about the NFPA?

A. I'm probably an affiliate member, because I -- and, again, I don't know the exact membership standards. I was in a while back and then I've been doing a lot of -- because of the design work, I decided to rejoin so I could get current on some of the codes that are applicable to what we're doing.

But I think it's if you're even interested in fire safety, they'll let you join. So typically it's like firefighters, fire marshals, engineers, code officials, people that work in that -- and even electricians. The National Electrical Code is an NFPA code.

So a long answer to a short question, probably about anyone.

Q. Okay. Are there any tests or exams that you have to undertake to become a member of either one of those organizations?

A. No, sir.

Q. Are there any continuing education requirements to be a member?

A. No.

Q. As long as you pay the fees, you're in good standing?

A. That would be correct.

Q. Sir, I'd like to ask you a little bit about your education starting with your undergraduate degree from, I believe, Purdue?

A. Correct.

Q. When did you begin your undergraduate degree at Purdue?

A. In 1972.

Q. And did you -- well, what was your major or area of concentration?

A. Mechanical engineering.

Q. Was that your major or concentration from the very beginning?

A. Yes, sir.

Q. Did you ultimately receive a degree from Purdue?

A. I did.

Q. What degree was that?

A. BSME, Bachelor's of Science in mechanical engineering.

Q. Was there any area of specialization, or was that a general degree?

A. It was a general mechanical degree.

Q. Okay. As part of your coursework at Purdue, did you take any courses in thermodynamics?

A. I did.

Q. Okay. And what courses did you take?

A. Thermody- -- basic thermodynamics, one semester series.

Q. So just one semester worth?

A. Yes.

Q. Did you take any courses on nuclear engineering?

A. No.

Q. Did you take any courses on heat transfer for power plants?

A. Yes.

Q. For what courses?
A. I don't -- I don't remember the course number, but I did take a heat transfer course. And I believe as an elective, I took -- yeah, I did take a power plant course also.
Q. Okay. The heat transfer course, what areas did that course cover?
A. General heat transfer, convection, conduction, radiation, heat exchangers.
Q. In your undergrad, did you receive any honors, prizes or fellowships?
A. I did.
Q. Okay. What did you receive?
A. It's called Pi Tau Sigma, and it was based on grade point averages. For a couple semesters I did pretty well and became a member.
Q. Are you still a member of that organization?
A. As far as I know.
Q. And does that organization have any continuing education or do you have any continued involvement with that organization?
A. No, sir.
Q. Pi Tau Sigma, is that like a standard Greek organization?
A. Yeah. It's mechanical engineering honorary.

Q. Now, while you were in undergrad, did you do any teaching work or graduate -- or, I'm sorry, assistant work in undergrad? I'll ask also about graduate later, but --

A. No.

Q. Okay. So you graduated in 1976.

What did you do then?

A. I went to work for -- if I can get my CV out, I can give it to you. In fact, would you like the CV now?

Q. Yes.

A. All righty.

Q. And, sir, if I can borrow your copy, we will mark it as Exhibit 4 to this deposition. Thank you.

- - -

(Deposition Exhibit 4 marked.)

- - -

A. Uh-huh. So your question again, please?

Q. After you graduated from Purdue undergrad with a BSME in 1976, what did you do after that?

A. I went to work for Armour-Dial in Montgomery, Illinois.

Q. What was Armour-Dial?

A. They made Dial soap.

Q. Okay. What did you do for that company?

A. I was a project engineer and then a maintenance supervisor.

Q. Okay. Did you do anything dealing with thermodynamics or heat transfer?

A. Generally speaking, everything I have done relate -- boilers are heat exchangers, air conditioners are heat exchangers, you know, regular heat -- heat exchangers -- heat exchangers are heat exchangers. Forgive me for being redundant. So most every -- no, I shouldn't say everything I've done, but a large, large percentage that I've done does involve heat exchangers. That's just the nature of the business in utility work.

Q. And specifically, what was your responsibility with respect to heat exchangers in that position?

A. Again, it's been so long, I don't recall specifically, but, you know, working with plant equipment, which do involve heat exchange.

I do remember one project. I don't know if it was ever resolved. But we were trying to heat up soap with steam. And for some reason, the heat exchanger was plugging and fouling too much. And I got a little bit involved with that, and then it got moved over to another area. So I did -- that was specifically with a shell and tube heat exchanger.

Q. Was there anything during your course of employment at Armour-Dial that relates to or is similar to the matters at issue in this case?

A. Well, it was -- and, again, in the general area of heat exchange, yeah, because, you know, we're talking -- we're going to be talking about heat exchangers today. You know, boilers are -- again, boilers are heat exchangers, so yeah.

Q. So only to the extent that you consider them both heat exchangers, that you worked with heat exchangers in that position with Armour-Dial and you believe that the issues in this case pertain to a heat exchanger?

A. Heat -- did you say a or -- you know, you said a heat exchanger or not -- I guess I'm not -- help me out. I'm not following your question exactly.

Q. Well, let me -- let me make it very clear and simple for you.

I want to know whether you plan on testifying that any of your work at Armour-Dial directly pertained to the type of work that you were doing in this case.

A. I would say yes.

Q. Okay. And what specifically pertained -- pertains to the work in this case that you've done?

A. Well, working with a heat exchanger at

Armour-Dial and working with their heat exchangers in the boilers, chillers, that type of equipment.

Q. What were your job duties and responsibilities with respect to working with the heat exchanger?

A. I thought I just told you.

Q. Well, you said that you had worked on one project where they were trying to heat up soap --

A. Uh-huh.

Q. -- and there was an issue with the heat exchanger?

A. Right.

Q. What was your specific job duty or responsibility with respect to that project?

A. I was doing the investigation.

Q. What did you do to perform that investigation?

A. It's been almost 40 years. I don't remember exactly.

Q. Okay. So you're not relying upon the work that you did in that position to formulate your opinions that you've given in this case?

A. Not true. That's part of my knowledge base. Even though I don't remember the specifics, it's part of my accumulating knowledge base. So, yeah, I do consider it relevant.

Q. Okay. So my question is, what did you learn in that position or what did you do in that position that you have applied in this case?

MR. LOMAX: Objection to the form of the question.

Q. What -- what knowledge did you obtain there in that position that you have now used and applied to your opinions and findings in this case?

A. Well, on the -- on the basic design of a proper heat exchanger, the basic construction of a proper steam heat exchanger.

Q. But you can't give me specifics?

A. Isn't that specific enough?

Q. Not for me.

A. Sorry.

Q. Okay. Sir, after that, I believe your resume says that you left that position in July 1977?

A. Correct.

Q. What did you do next?

A. I went to work for -- went back to Purdue, worked for the planning and engineering department. I had worked there as a student, and then I went back as an engineer. And then I was a project engineer mostly working on, like it says, retrofit heating, ventilating, air-conditioning systems on campus.

Q. Did that position involve working with any type of power generation plants?

A. I worked a little bit in the power plants. In fact, I was slotted to become the superintendent of the power plant.

Q. Did you ever become the superintendent of the power plant?

A. No, sir, I did not.

Q. Okay. And, sir, you said you worked a little bit with the power plant.

What kind of power plant was that?

A. It was a coal-fired heating power plant. I can't recall if we did any electricity generation, but it was definitely a heating plant for the -- most of the entire campus.

Q. What was your job duties and responsibilities with respect to that plant?

A. Pretty much just starting to learn since I hadn't been out of school that long, starting to, you know, work with them and, you know, get more into the details of it and understand how a power plant works.

Q. Let me skip ahead and then we're going to come back to the rest of your employment.

Did you ever go back to school for a

postgraduate degree?
A. I did.
Q. Okay. And where was that?
A. The Ohio State University.
Q. And what degree did you go back for?
A. It's called mechanical engineer.
Q. And, sir, it says here on your resume that it's a mechanical engineering professional degree?
A. Correct.
Q. What does that mean?
A. It's basically a nonthesis master's. I did a project instead of writing a thesis. And it's more of a -- instead of being like an academic track degree, it's more of a working engineer track degree.
Q. Okay. And is that considered a master's degree?
A. They couldn't bring theirselves to call it that, but yes, it is.
Q. Well, who couldn't bring themselves to call it that?
A. The Ohio State University.
Q. Do they recognize it, The Ohio State University, does The Ohio State University recognize that degree as a master's degree today?
A. I'm not sure they even award it. To the best

of my knowledge, there was only 17 people, including myself, that got that degree. I think they have gone back -- more back towards a traditional research oriented master's degree.

Q. But as far as you're aware, they do not recognize it as a master's degree?

A. Not per se or they'd call it a master's degree.

Q. And how long were you enrolled in that program?

A. I think it took three years, give or take, part time. I was working at the time.

Q. Was it like night school or --

A. No. Actually, since I was working on campus, I was working at the university, so I just made an arrangement I could go over -- the ME building was only a couple hundred yards from the power plant, so I'd just go take classes and then adjust my work hours accordingly.

Q. Okay. And when were you awarded your professional degree?

A. 1988.

Q. And for that degree, you did not have to write any thesis or dissertation?

A. Correct.

Q. In that degree, did you take any courses in thermodynamics?

A. I don't believe I did.

Q. Okay. Any courses in nuclear engineering in that degree?

A. No.

Q. Any courses in heat transfer?

A. I don't think so.

Q. What was your focus or what was the focus of your coursework for your professional degree?

A. It was to round out my -- my education. I knew that I was never going to become a professor, I was going to be a working engineer. So I tried to structure it to take the courses that I would like to have taken when I was getting my bachelor's and didn't have time. So refractories was one course, welding, you know, some of the more -- some of the other courses just to round out my knowledge base.

And then as part of that, instead of writing a thesis, we had to do a project write-up for a project we were doing at work, so I did -- that was kind of a -- what they would consider the equivalent of a thesis, we were doing a project and then writing it up.

Q. And what was your project?

A. I put in -- we put in a coal-fired boiler when I was there. Excuse me. This was after the Arab oil embargo, so the university decided to put in a coal-fired boiler. And as part of that, we decided to have -- you know, we would upgrade the pressure level of the boiler at not a huge expense and be able to cogenerate.

So we actually put in a 3 megawatt back-pressure turbine to generate power coming off the boiler. I, in addition -- instead of just generating straight steam. So I was the one that did the feasibility study and then I was the project manager and the construction manager for that project.

Q. Okay. And during your coursework at Ohio State, did you receive any honors, prizes or fellowships?

A. No, sir.

Q. While you were taking your courses at Ohio State, did you also engage as a graduate instructor or take any teaching role on?

A. I did.

Q. Okay. In what capacity?

A. One of my professors, a fellow named Robert Essenhigh, was typically -- he was the person that taught ME, I believe it was 625 if I've got the number right. It's somewhere in here. Maybe it's not. I believe it was ME625, which is a dual level power plant course. And so I taught that course in his stead. He was obviously -- he was supervising it, but I taught the course, did the grading and so forth.

Q. Were you compensated for that?

A. I think a couple hundred bucks.

Q. Other than -- and how many semesters did you teach that course?

A. Just one. I believe it was -- I think OSU was on quarters and not semesters.

Q. Okay. So one quarter?

A. Correct.

Q. Had you taken his course prior to being a graduate assistant?

A. No.

Q. So how --

A. Now, I did take a -- when you say "his course," I did take a combustion course from him, but not the power plant course. I believe that was only offered every other year.

Q. Okay. So had you taken the power plant course that you ultimately were a graduate assistant for prior to --

A. I took the similar course when I was at Purdue. I believe that was ME425, if I recall. So it was basically the same course at Purdue that I had taken several years earlier that I was then teaching at OSU.

Q. Do you know why you were selected as a graduate assistant by Mr. -- I'm sorry, I've lost his name.

A. Dr. Essenhigh?

Q. Dr. Essenhigh.

A. Yeah. Because he liked me and I was one of his -- he was one of my graduate -- what's the word I want -- advisors, and he knew I would do a good job teaching the course, and I did.

Q. Other than being a graduate assistant in that one quarter, have you taught any other professional courses or continuing education?

A. I have.

Q. And what courses have you taught?

A. The courses that I teach now are, I would call them boilers 101, air conditioning 101, pumps 101. They are courses -- I teach for several companies. It's listed in the back of my CV. American -- it's now TPC Trainco, National Technology Transfer, Lewellyn I've taught for, Versa-Tech, and then I teach my own courses.

So I looked the other day. You know, over the last what, since 1995-ish, I've taught a little over 200 courses.

Q. What are the subject matter of those courses?

A. Basic -- now, are you referring to boilers? Do you want to stick to boilers, or the other stuff, too?

Q. Well, I'd like to know generally the subject matters.

A. Okay. Sure.

Q. I assume -- if you can give it to me generally, then there may be areas that I focus in on, will ask further questions. But if you can tell me generally what the courses have covered.

A. Sure. In the boiler course -- in both the boiler and the air-conditioning courses, we talk about some basic thermodynamics. In the air conditioning courses, I go into it very, very deeply.

In the boiler courses, not quite as much. We talk about safety in the boiler system. We talk about the burner management system. We talk about the fire side, we talk about the water side. We talk about superheat. I mentioned safety. That's it off the top of my head. If I think of anything else, I'll --

Q. Okay. Of the courses you've taught, are there any that you would -- that you would find to be

applicable to the matters and issues in this particular case?
A. Yes.
Q. Which courses are those?
A. All of them.
Q. Okay. Even the AC courses?
A. Oh, absolutely.
Q. Okay. Even the safety courses?
A. Absolutely.
Q. How are the safety courses relative to the matters at issue in this case?
A. Well, in the air-conditioning business, safety -- safety is always an issue in the industrial world. Okay. But a boiler of any kind is actually a ticking time bomb. And a boiler -- as anybody knows, with boilers, there's lots of hazards involved. All right. And so I am always cognizant when I'm working around boilers of boiler safety. And I'm kind of anticipating where you'll be going with questioning through the day. You know, the -- I will call it the E-Cat, the device, you know, however we agree to describe it, is, in one sense, a boiler.
And so boiler safety issues, in my professional opinion, are very, very relevant to the discussion.

Q. Do you -- do you have any printed materials from these courses that you've offered?

A. Not with me. You can -- you can find them. You can get a syllabus if you go to the appropriate websites. You can kind of get a --

Q. What websites?

A. Well, one would be like for -- I can give you the company name. TPC Trainco is one. NTT, National Technology Transfer. And they're both on the south side of Denver. I'm not so sure about Lewellyn. I haven't taught with them for a while. But they're -- the general courses are quite similar because they're competing companies.

So basically, the boiler class is basically a two, two and a half day boilers 101. Okay. I teach courses on -- I teach for the State of Arkansas in preparation for their people taking the licensing exam. I've got a contract with Arkansas.

So, again, the subject matter, regardless of who's teaching it, is pretty much the same body of knowledge, just different slide shows, a little different arrangement, but the body of knowledge is virtually identical.

Q. Do you maintain any professional licenses?

A. Yes, sir, I do.

Q. What licenses?
A. All right. I have a P.E. from the State of Ohio. I have a P.E. from the State of Illinois. I have a P.E. from the State of Texas. And I have an Ohio 3rd class stationary engineer's license. I also have an EPA 608 universal technician certification.
Q. I'm sorry, the last two were Ohio 3rd class --
A. Stationary engineer.
Q. And then the last one?
A. EPA 608 universal technician.
Q. Okay. For your P.E. -- professional engineer; is that correct?
A. Yes.
Q. -- from Ohio, did you have to take an exam for that?
A. I did.
Q. Okay. How many times did you take that exam?
A. One. I crushed it.
Q. How about the P.E. from Illinois?
A. No exam. Once you have -- once you have a P.E. -- generally, in this country, once you have a P.E. by exam, then it's just a matter of money. You've got to provide the documentation of your experience, your degrees and so forth, but then it's always about

the money.
Q. Okay. So there was no further education or training or testing that you had to undergo through -- to get your P.E. from Illinois?
A. No, sir.
Q. What about Texas?
A. Texas did have an ethics -- they do have an ethics exam.
Q. An ethics exam?
A. Yes, sir.
Q. Anything relating to the actual engineering work?
A. No. It was about engineering ethics, conflict of interest, things like that.
Q. Okay. The Ohio 3rd class stationary exam --
A. Yeah, correct.
Q. -- what is that?
A. That means I can legally operate any nonnuclear boiler in the State of Ohio.
Q. Nonnuclear boiler?
A. Yep.
Q. Is there such thing as a nuclear boiler?
A. I think there's a few units in Ohio, yes.
Q. And that's not the same as a power plant, correct?

A. Oh, yeah, it is. Yeah. Now, maybe I'm -- help me with your question. I'm sorry.

Q. Okay. A boiler is the same thing as a power plant?

A. A boiler is a component of a power plant.

Q. Okay. So you can't operate a power plant, you can operate the boiler?

A. I can operate the boilers and the turbines.

Q. Have you ever done that?

A. I have at Ohio State a little bit. Again, it was a union shop, so, you know, wink, wink, nod, nod. And I had to have some operating time to get that license, obviously.

And then I've operated boilers at Nestle's up in Marysville. I was a relief boiler and refrigeration operator up there as well.

Q. Okay. Let me ask you first about Ohio State.

A. Sure.

Q. How much time did you have operating a power plant at Ohio State?

A. I think the -- I think it's 900 hours. As I recall, it was 900 hours.

Q. And is that between July 1977 and May 1979?

A. No. No.

Q. When did you --

A. That was --
Q. Okay. I'm sorry. Was that between 1983 and 1988?
A. Correct.
Q. You said Nestle's?
A. Nestle's in Marysville, yes.
Q. How much time -- and what type of power plant did Nestle's have?
A. It's actually a heating and refrigeration plant. There's no power generation involved there, but it is a heating and refrigeration plant that I operated.
Q. Okay. Was there power generation at Ohio State?
A. Oh, yeah. I put in a back-pressure turbine, then we also had two condensing turbines.
Q. What fuel source?
A. Coal. I think they had oil and gas as a backup, but coal was the predominant on the one boiler, the newer boiler. Then the older boilers used gas and oil as a backup.
Q. Okay. The EPA 608 universal technician, what is that?
A. That means that I have passed a test and I can legally purchase refrigerants.

Q. Does that certification have anything to do with the work that you've done in this case?

A. No.

Q. The Ohio 3rd class stationary engineer certification, does that have any applicability to the work that you've done in this case?

A. It does have some general applicability, yes.

Q. What did you have to do to get that certification?

A. Well, I had to, again, demonstrate that I'd operated for, I think, 900 hours, again, if my hours are right, and I had to take a comprehensive exam.

Q. How long was the exam?

A. I don't think there was a time period. There was an essay question back when we actually had to set the slide valves on an old-fashioned pump, but I'd say it took about three hours, ballpark.

Q. And you maintain that certification in good standing?

A. Yes, sir.

Q. Do you have to do any continuing education to maintain that certification?

A. No.

Q. Do you have to do -- well, do you have to pay a yearly fee to maintain that certification?

A. Was that a rhetorical question? Yes, sir, I do.

Q. Who issues that certification?

A. The State of Ohio.

Q. Who issues the certification for the EPA 608 universal tech?

A. The US EPA.

Q. You said there was an exam for that?

A. Yes.

Q. And how long was that exam?

A. Again, there's no time limit. It took me about an hour and a half.

Q. And you maintain that certification in good standing?

A. Yeah. That's a one-time license. Once you pass the test -- you know, at least for the last 20 years, once you have it, you have it, and that's it.

Q. You don't have to do anything to renew it?

A. No, sir.

Q. Do you have to do anything to renew the 3rd class stationary engineering certification?

A. Pay them money.

Q. Now, when were you issued the Ohio 3rd class stationary engineer certificate?

A. I want to say 1988.

Q. Okay. What about the EPA 608?
A. That was about ten years ago; 2006, 2007 time frame.
Q. Now, going back, sir, to follow through on your employment, after working at Purdue University, which your time there ended, I believe, in May of 1979, what did you do after that?
A. Went to work for Alcoa. Purdue is in West Lafayette, Indiana. Alcoa is in Lafayette, across the river.
Q. Alcoa is Aluminum Company of America?
A. Yes, sir.
Q. And what was your job title at Alcoa?
A. Mechanical engineer.
Q. What were your job duties and responsibilities?
A. Well, as you can see, I was in charge of energy conservation for the plant. And then, basically, I was the utility engineer over the boiler house and some annealing furnaces.
Q. I'm sorry, you said utility engineer over a boiler house?
A. Yeah.
Q. What did you do in that role?
A. I worked with the superintendent of the

boiler plant. He did the operational end of it, I did the engineering end of it, so we worked together to run and operate the power plant, whether he -- it was really a heating plant and not a power plant.

Q. What's the difference?

A. Well, you get into semantics. A power plant specifically will generate electricity. A boiler plant or heating plant may just generate steam or hot water for either process or heating use. Sometimes people use the terms interchangeably.

Q. Was that a steam plant, sir?

A. Yes.

Q. What was the steam used for?

A. Building heat.

Q. I'm sorry?

A. Building heat. Heating the building.

Q. Okay. For a moment I thought you were saying building in the terms of constructing heat.

A. Oh, no, no.

Q. I was trying to figure that out. I apologize.

A. No. No. No. No. Heating the facilities.

Q. Okay. And I believe on your resume, it says, discovered and engineered a heat recovery project for an aluminum chip dryer.

A. That's correct.
Q. What was that?
A. There was a chip dryer that basically -- it's an old -- it was an old -- I'm trying to remember the details now. It was an old furnace that they had converted. They put some conveyors in it, because in that particular realm, in the aluminum extrusion business, at least then, they had large, round, cylindrical billets that they would machine down to a certain size before they would put that into the extrusion machine, kind of like plastic extrusion, and then a hydraulic ram would force that aluminum through a die to the desired shape.
So the chips that come off of that, there was cutting oil, and so you don't want to put water into molted aluminum, because you're going to have a very bad day if you do. So the purpose of the chip dryer was to heat these chips, dry the water and the cutting oil off so that they're fairly hot and dry when they go into the melter. We called it a toilet bowl melter. It was actually a -- almost like a toilet flushing, a circular motion with a molten aluminum in it. And then those chips would be fed in, they would be remelted and then realloyed.
So what I did is I discovered a way to put a

-- rather than -- it was a big open -- the furnace was actually about the size of this room with a couple conveyors. And I think I discovered a way to put a cover over the conveyors and then take that heat and use it to preheat the chips, as I recall.

Q. Now, the boiler in that plant, do you remember how much heat it would put up?

A. I do not. And actually, there were three boilers at that plant, not just one. They were large, though. I would say between the three of them, they were probably each 100,000 pounds an hour of steam.

Q. 100,000 pounds per hour. Wow. And there were three of them each at that level, so 300,000 pounds per hour?

A. Yes, sir, total, yeah.

Now, typically we'd only run two. You have a backup so that if one goes down in the dead of winter, you've still got a backup running. So typically the steam loads -- maximum steam load would be 150,000, 200,000 pounds an hour-ish. And then you've always got the other one either sitting there or on hot standby so that if one of the other boilers quits or has a problem, we can bring the hot one up and keep the plant warm.

Q. Okay. And how large was that facility?

A. I don't follow you.
Q. The building, how large was the building where these --
A. Which building?
Q. The building where these boilers were located.
A. The boiler house proper? It was a separate building from the factory. Probably 100 feet wide, 150 feet long and probably four stories tall, ballpark.
Q. Do you know the amount of energy that was put out by these boilers at any given time?
A. Well, it would depend on the measured steam load and then what steam pressure was. And they were putting out saturated steam, not superheated.
Q. What does that mean?
A. Saturated steam can exist in a boiler proper. And, again, we'll probably get into the minutia of this later on. Saturated steam is the steam that exists at a given temperature and pressure within a pressure vessel. Okay. The concept also applies to air conditioning.
Superheating vapor, and I use the term vapor right now, superheated vapor is vapor that is heated over and above the saturation temperature for the temperature pressure conditions in the boiler.

Q. Okay. What was the temperature of the steam at the Alcoa plant?

A. I don't remember exactly, but if it was 150 -- and I want to say they were 150 psi boilers. So I believe, if my memory serves, the saturation temperature is 366 Fahrenheit.

Q. I'm sorry, and what pressure was that?

A. 150 psi. Again, don't quote me on that because I don't have that memorized, but I think I'm right. Pretty close.

Q. Okay. After your time at Alcoa, your -- now, why did you leave Alcoa?

A. I -- a friend -- a friend who had -- I had worked with at Purdue had gone down to Cummins a couple years before that. And my wife's family only lives about an hour -- Cummins is in Columbus, Indiana. My wife's family lives about an hour from there. And so this other gentleman I worked with at Purdue said, hey, there's a job opening here. Do you want to come down and interview for it?

I said, sure, why not, because -- you know, Alcoa, I was learning, like I used the corporate nomad. You know, they transfer you every three or four years whether you wanted to or not. And I didn't really want to do that for the rest of my life, having lived out of

a seabag in the Marine Corps.
So went down to Cummins, interviewed, got the job.
Q. What was your job title at Cummins?
A. I was a facilities project manager.
Q. What were your duties and responsibilities in that position?
A. Again, as it says, maintenance and engineering for five large building [sic]. And then engineering services for an additional 25 buildings.
Q. Now, you state here, converted three boilers to dual fuel capacity to minimize fuel costs.
A. I believe that's capability, but --
Q. I'm sorry, you're right, I misread it.
A. No problem.
Q. Did you do the conversion yourself?
A. I did not physically do it. I did the engineering, wrote the purchase orders, wrote the construction contracts.
Q. Did anyone else look over the engineering prior to it being implemented?
A. No.
Q. Did you work on a day-to-day basis with those boilers?
A. Sporadically. You know, it -- you know, you

write a purchase order, wait three months for the stuff to come in, so it's like a lot of -- I understand you worked in construction, so you know the drill. You order something, you wait, it comes in and you work on it, you go back to it. So you bounce back and forth between different jobs, you know, to fill your day up, so --

Q. Did you have staff that worked under you?

A. I did.

Q. How many people?

A. Was it two or three? They were maintenance tech- -- or maintenance supervisors.

Q. So it's your testimony that you did the engineering to convert the boilers to dual fuel capability?

A. Well, we were actually converting the burners. All right. It wasn't the boilers, per se. We did a burner changeout.

Q. Now, looking on your resume to the next listed employment, and it's on the first page, it says, October 1983 to June of 1988, back to The Ohio State University.

A. You got it.

Q. First of all, why did you leave Cummins?

A. I got laid off in the bloodbath of 1983.

Q. Now, you returned to The Ohio State University.

What was your -- upon returning, what was your job duty -- or your job title? I'm sorry.

A. I started, I was an engineer. And after three or four years, I got promoted to senior mechanical engineer.

Q. Okay. So you were senior mechanical engineer for only a couple years while you were there?

A. That would be correct, yes.

Q. You say you successfully managed a $7 million steam line expansion project.

Can you tell me about that, please?

A. I can. What we did is the -- back then McCracken Power Plant only served that part of the campus which was east of the river. I believe it's the Scioto. And the midwest campus and the west campus did not have steam feed. They all had remote boilers, a boiler per building or two boilers per building.

And then down in the hospital complex, that was -- even back then, it was growing, so we reinforced the steam feed.

So what we did is like we had an outside consulting engineering firm do the design to expand the steam line from McCracken Power Plant across the river to the various buildings in the midwest campus, and then we reinforced the feed south from McCracken to the hospital complex.

Q. How was the steam moved in those --

A. Pressure differential.

Q. What does that mean?

A. You have to have a pressure difference for any fluid to flow.

Q. So how was that accomplished?

A. Pressure differential.

Q. Was there a vacuum on one side, or was there a forcing pressure on the other?

A. No. The steam -- the steam leaving the plant was at 200 psi, and was it 5 -- I believe it was 588 degrees if my memory serves. So we had about 200 degrees of superheat leaving McCracken Power Plant.

Q. Again, that's Fahrenheit, correct?

A. Yeah. I -- we probably will go back and forth on C and Fahrenheit. Normally I work in Fahrenheit, but I'll try to accommodate you working with centigrade and the metric system.

Q. I appreciate that.

And that was superheated steam?

A. Yes, sir.

Q. Now, you said it crossed a river --

A. Correct.
Q. -- or river bridge.
Was that aboveground, belowground, under the water?
A. A lot of -- the river crossing, per se?
Q. Yes.
A. Underneath -- we hung it underneath of a pedestrian bridge.
Q. Okay. And what type of piping was that --
A. It was --
Q. -- or what type of --
A. It was called -- the company was actually called at one point Nova. Yeah, it was Nova. I don't believe they're in business. But it was a pipe in a pipe structure. We had the steam -- the actual steam carrier as the inside pipe, insulation around it, and then there was an outer pipe that served as a barrier, and actually there was -- between the insulation and the air space to keep the heat in the steam and keep the heat losses to a minimum.
So it's called a pipe in a pipe or a direct bury system. So we actually dug up a lot of the campus and buried that pipe and then backfilled back over it and then ran the steam line underground.
So when we got to the bridge, we came up from

the ground, ran it underneath the bridge and then back down underground and wherever.

Q. Why did they have insulation between the pipes? I guess I don't understand.

A. Okay. The pipe, it's actually a concentric pipe, so the inner pipe would be the steam pipe carrier. And then it would be insulated to maintain the heat, because anything -- temperature flows from hot to cold. So if you have 588 degree steam, it's going to lose heat pretty rapidly, so you --

Q. Off the walls of the pipe, or where would it lose --

A. Yeah, from -- from the pipe wall itself. An outer pipe wall itself is going to -- the inner -- the steam carrying line would lose heat.

Q. Okay. How much heat loss did you have in that insulated piping per -- let's say, per foot?

A. Oh, I don't remember exactly. There's charts and tables that could do that. Again, I don't carry that knowledge around in my head. You can calculate it. The manufacturers have calculated it. So if you tell them what the steam conditions are, they'll say you will have, you know, X number of BTUs for heat loss per foot, per hundred foot, you know, whatever.

Q. Okay. And that heat that is lost through the

pipe walls, where does it go?
A. Out from the -- from the pipe.
Q. Okay. So into the external environment around where the pipe is?
A. Right, through the insulation. The heat goes through the insulation and then the air surrounding that, you know, that air will heat up, the exterior pipe will heat up some, and then, like you say, the surroundings will heat up until it reaches equilibrium.
Q. Sir, have you published any papers?
A. There are magazine articles, not print papers, per se.
Q. Okay. Were they peer reviewed?
A. No.

- - -

(Deposition Exhibit 5 marked.)

- - -

Q. Sir, I'm going to show you one that we will mark as Exhibit 5.
A. I have five of each for you.
Q. We'll use yours.
A. Do you want them both?
Q. Yes, please.
A. There you go.
Q. Thank you. We'll mark the first one, which

is titled Safety on Trial, 75-Ton Bottle Rocket Case Study.

Sir, this first document, which we've marked as Exhibit 5, what is this publication on?

A. The publication is the National Board. And it's technically the National Board of Boiler and Pressure Vessel Inspectors. They're located here in Columbus up on Crupper Avenue. And what I did is I wrote this article and another one on a couple of cases that I had worked on that related to boilers and pressure vessels.

So just giving kind of the basics of what happened and then how what happened might help boiler inspectors to look at, you know, other different things, maybe help them to do their job, you know, a little better.

Q. Was it -- was that particular case regarding a boiler malfunction or failure?

A. No. This was actually a pressure vessel failure.

Q. Does the information contained in this document pertain to or relate to the matters at issue in the instant case?

A. Very generally, yes, because it involves steam and, you know, boiler and pressure vessel technology, but maybe specifically, not real directly.

Q. Was there any boiler or pressure vessel failure in the instant case? In the instant case, was there any failure?

A. Oh, the bottle rocket?

Q. Was there any failure of a pressure vessel or boiler in this case that you're here testifying on today?

A. Not that I'm aware of.

\- - -

(Deposition Exhibit 6 marked.)

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Q. Sir, I'm going to show you what I've marked as Exhibit 6, which is a publication called Winter Storm Warning, Elementary School Boiler Malfunctioned After Ice Storm.

A. Correct.

Q. And is this your second publication, sir?

A. Yes, sir, it is. I believe it's the second. Yeah, it was the second. You're right.

Q. Okay. Does the -- strike that.

This document, sir, pertains to a boiler failure as well?

A. It does.

Q. Was there any methodology or considerations that you applied in this case that are also applicable to the instant case?

You know what, I'm sorry, let me rephrase that for the record.

Were there any methodology or considerations that you took into effect in examining this elementary school boiler malfunctioning that you believe also to be applicable in the instant case?

A. It may or it may not be. Based on the documentation I've seen so far, there may be some safety issues involved. As we both know, I have yet to do a site inspection at the Doral facility, so, you know, I do reserve the right to modify my answer based on what I may or may not see later in the week.

Q. Have you made any safety determinations as to the E-Cat or the Doral plant in this case?

A. Based upon -- again, based on not having physically seen it, but based on what I understand about the construction, I -- I have made a bit of a determination, yes.

Q. Okay. We're going to get to that in just a minute.

But just back to your publications real quick, so neither one of your publications have been peer reviewed?

A. No.
Q. Were you compensated for these publications?
A. No.
Q. Did you rely upon any other publications or any other methodologies in preparing these publications?
A. Well, the totality of my education and experience went into both of them. So, yeah, all of that went into it.
Q. Did you reference any documents specifically with respect to these publications other than your general knowledge?
A. I don't believe I did.
Q. Are there any methodology -- methodologies contained within this that could be contested?
MR. LOMAX: Objection to the form of the question.
A. I imagine they would have been contested by now, so I -- I would say no.
Q. Well, do you -- do you specifically refer to any methodologies in your examination, or is this more like a case study?
A. This is more like a case study. All right. You know, there was no litigation -- well, in -- in the winter storm warning, there was no litigation. In the

bottle rocket, there was litigation. There was no litigation in the school issue.

Q. Now, did you act as an expert in the bottle rocket case?

A. I did.

Q. And what was the name of that case?

A. It was in Danville, Virginia. I don't remember right now. It's been, golly, almost 20 years ago.

Q. Okay. Were you --

A. If I think of it, I'll pop it up.

Q. Did you provide any testimony in that case?

A. Did I do a deposition there? I was deposed in that one, yes.

Q. And when was that?

A. Oh, I want to say mid-'90s maybe, mid to late '90s.

Q. Are there any similarities between the factual circumstances of the bottle rocket case and the instant case?

A. Not that I can think of right now.

Q. Did you have any co-authors that assisted you in preparing those publications?

A. No.

Q. Did anyone ever suggest that you do

additional research into those matters?
A. No, sir.
Q. Has either one of these publications ever been cited, to your knowledge?
A. No, sir.
Q. Has anyone requested the right to reprint these publications from you?
A. Not that I'm aware of. Actually, the National Board holds the copyright and not me, so they would be the ones to do that.
Q. Do you know if anyone has requested to reprint them?
A. I do not know.
Q. Are you familiar with any literature expressing contrary views to the views that you've expressed in these two publications?
A. I am not familiar with any, no.
Q. Sir, looking back to your resume again -- well, I'm sorry. Strike that. I'll have you look at something else.
Sir, you've rendered a report in this case, correct?
A. I did.

- - -

(Deposition Exhibit 7 marked.)

- - -

Q. I'm going to mark this document as Exhibit 7.
Sir, is this a copy of the expert report that you have rendered in this case?
A. Yes.
Q. And if I can, could you please turn to page 22 of your report, the section entitled Expert Witness Experience?
A. Okay.
Q. I believe you've listed four cases --
A. Yes.
Q. -- correct?
A. Correct, yes.
Q. Are those all of the cases in which you have testified at trial or deposition during the last seven years?
MR. LOMAX: Objection to the form of the question.
MR. ANNESSER: What's the objection?
MR. LOMAX: It's different from what has been stated in the document and what you've asked before, so --
MR. ANNESSER: And the grounds for the objection, though?
MR. LOMAX: Form of the question. It's

misleading based on what's in the document and what you've stated before.

BY MR. ANNESSER:

Q. Sir, these four cases that you've listed, are those all of the cases in which you've testified either at trial or in deposition during the last seven years?

A. No, sir. And the reason for that, I was -- I was under the impression, at the time I prepared the report, it was for the prior four years, which I understand is federal rules. So my under- -- you know, my understanding may have been complete [sic], that's why I brought in the extra documentation to supplement so that I would be -- you know, give you what you were asking for.

Q. How many additional cases have you testified in within the last seven years --

A. I think --

Q. -- that are not listed here?

A. I think it was -- now, my understanding, it was six years. All right.

Q. I'm asking you, sir, within the last seven years.

A. In looking -- I brought in documentations for six cases. So I -- as I recall now, I think I went back ten years.

Q. So six cases within the last ten years total?
A. I -- I believe that's correct.
Q. And would that include the four that are listed here?
A. Yes, sir, that's correct.
Q. And you said you brought that documentation?
A. Well, it's -- what it is -- where is it now? I put it down here. Yeah, here it is.
What these are is Microsoft Access, like all Microsoft products, has a mind of its own and it's hard to write reports. So what these are is these are screenshots from my own internal database just to -- you know, to document my jobs, you know, and just kind of the basics of the jobs.
So these are screenshots from the -- I believe it's that ten-year time window, yes.
Q. Okay. So what are the two additional cases that are not listed on your report that you have testified in within the last ten years?
A. Okay. That would be -- the case -- let's see, the case would be -- the older one was E3 v. Biothane, et al.
Q. E3?
A. Yeah, E3, echo three, versus Biothane, B-I-O-T-H-A-N-E, et al. And the second one is Young

versus FirstEnergy.

Q. Okay. Starting with the first one on your list, Jerew versus Rhodes Heating --

A. Okay.

Q. -- what was the nature of your testimony in that case?

A. All right. The case -- this was a pretty simple one. It was a mobile home furnace fire. A technician had serviced the furnace. And then the question I was called to answer, did the technician make the furnace as safe as possible after he had worked on it after the owner wanted it shut down to replace it.

Q. Okay. Were the issues in that case at all related to -- I'm sorry, not related to, but were the issues in that case at all similar to the issues in the instant case?

A. No.

Q. The second case you have listed, Akron Fairlawn Properties versus Edgell Plumbing?

A. Correct.

Q. What was the nature of your testimony in that case?

A. Okay. This one was a premature boiler failure. And the alleged cause of the failure was running a boiler with incoming water below 140, which can cause corrosion and other issues inside a hot water heater boiler.

Q. Now, let me ask you, on Jerew versus Rhodes, did you testify for the plaintiff or the defendant in that case?

A. Plaintiff.

Q. Okay. What about in Akron Fairlawn?

A. That would be plaintiff also.

Q. Okay. Now, the issues in the Akron Fairlawn Properties case, were they in any way similar to the issues in this case?

MR. LOMAX: Objection to the form of the question.

A. Not really.

Q. Did you prepare a report in either one of those cases?

A. Let's see here, verbal and in -- yeah. Let's see, the boiler failure at a Holiday Inn, I did prepare a written report.

Q. I'm sorry, that was the Akron Fairlawn case?

A. Yeah. Yeah, I'm sorry, Akron Fairlawn, you're correct.

Q. Did you ever testify at trial in that case?

A. I did.

Q. And did the court find you to be an expert?
A. As far as I know, they did.
Q. You don't know either way or --
A. Well, I testified, so I'm assuming that they recognized me as an expert.
Q. What about the Jerew versus Rhodes Heating case?
A. I did testify in that one also.
Q. Do you know if you were found to be an expert in that case?
A. Again, as far as I know, I was.
Q. Were those jury cases or were those bench trials?
A. Let's see, jury -- the Akron Fairlawn was jury. And Jerew versus Rhodes, I believe that was a bench trial.
Q. Now, the next one you have listed is Richmond versus Sears Roebuck.
A. Yes.
Q. What was the nature of your testimony in that case?
A. That was a carbon monoxide poisoning case.
Q. And what was the nature of your testimony?
A. It was a deposition and I was testifying to the fact, you know, how carbon monoxide is formed, the

influence of drafts and so forth on water heaters and their combustion systems and how carbon -- carbon monoxide is formed. I didn't -- I did not testify as a medical expert, even though I understand what carbon monoxide does to people. I was looking at their mechanics of the formation of carbon monoxide.

Q. Was your test- -- well, was the subject matter of your testimony in that case at all similar to the facts and circumstances that you've considered in the instant case?

A. No.

Q. Did you apply any similar methodology between any of these three cases and the instant case?

A. Well, I -- there's a certain engineering methodology that we use. It's not necessarily written. It's just the way we're trained to approach problems, look at things, analyze things. So -- so that's -- I have used that general approach in almost all of my work.

Q. So you look at the facts, you analyze them and come to a conclusion based on your analysis?

A. Generally, yeah.

Q. Okay.

A. And, again, now, if I'm just doing an analysis of something, I'm looking at numbers and so forth, but it's the same kind of general orderly thought process, yes.

Q. Okay. And did you testify on behalf of the plaintiff or defendant in that case, in Richmond versus Sears Roebuck?

A. Plaintiff.

Q. Next you have listed the Young versus FirstEnergy case?

A. Correct.

Q. What was the nature of your testimony in that case?

A. That was -- again, we discussed it a little bit earlier. A gentleman was working inside a very, very large deaerator and some hot water, I would say burped would be the appropriate word, back into it causing him some severe anxiety.

And so the issue was, was this vessel in which they were working, was it properly isolated from the rest of the plant so that they could safely work in that vessel.

Q. Okay. Were the issues that you testified to in that case at all similar in any manner to the facts and circumstances that you've considered in our case today?

A. "In any manner" is a little broad. Can you tighten that up a little for me?

Q. Yes. Is there anything in the testimony that you gave in that case that may be similar to the testimony that you are providing with respect to the case that we're here on today?

A. Nothing I can think of right now.

Q. Did you apply any similar calculations or methodology?

A. I didn't do calculations, but I did look at drawings and do a lot of analysis on valving and flow and so forth. So from that standpoint, yes, there is a correlation.

Q. Okay. Flow of what?

A. In this case, it was steam and then potentially some water.

Q. Okay. And in that case, in the Young versus FirstEnergy case?

A. Yes. Yeah.

Q. Okay. That was steam and water?

A. Steam and water, yeah.

Q. Okay. And what about the instant case?

A. Well, in the instant case, there's allegedly steam and there's definitely water flowing.

Q. Okay. And what type of flow analysis did you do with respect to the Young versus FirstEnergy case?

A. Okay. Now, it was not a pressure drop analysis, it was looking at flow routing and paths through valving to see could fluid get from point A to point B.

Q. Okay. And have you done that type of analysis in the Rossi v. Darden case?

A. In a manner of speaking, yes, I've looked at the flow paths of which I'm aware and -- yeah, I've looked at the flow paths.

Q. Okay. For what purpose?

A. Well, to understand -- try to understand what was going on.

Q. Did that -- did the Young versus FirstEnergy case deal with heat dissipation at all?

A. When you're working with boilers and hot fluids, there's always heat dissipation because -- because -- and, again, let me give you an example. You've got a cup of coffee there or had a cup of coffee. All right. And let's say it's 160, 180 degrees. As it sits in this room, it's going to cool down. All right. And when it heats -- reaches room temperature, the heat transfer will stop.

So anytime -- again, in my -- my business, in the world in which I work, heat dissipation is pretty much always occurring in some way, shape or form.

Q. Okay. My question was not whether heat dissipation or heat transfer was occurring.

My question was whether your testimony in that case pertained to any heat transfer or whether you did any heat transfer analysis in that case.

A. Now, in that, no. No. The way you phrased the question now, no.

Q. You also mentioned another case, E3 v. Biothane.

A. Correct.

Q. What was the nature of your testimony in that case?

A. This was an ethanol plant out in eastern Nebraska. And it went bankrupt and there were the two large boilers that failed. And so at issue was, did the failure -- were the boilers the cause of the failure or were they the victims, if you will, of other circumstances that caused them to fail.

Q. Did your testimony in that case -- first of all, did you testify at trial in that case?

A. I did not.

Q. I'm sorry, I want to take a step back to the Young versus FirstEnergy case.

Did you testify for the plaintiff or the defendant?

A. I was for the plaintiff.
Q. And in the E3V [sic] versus Biothane case, were you plaintiff or defendant?
A. Defense.
Q. Now, in the E3V versus Biothane case, did you do any type of heat transfer analysis in that case?
A. No, sir.
Q. Did you apply any of the same methodology that you've applied in this case in that case?
A. Again, with the general methodology that I previously described, yes.
Q. And by "general methodology," just your -- your knowledge of boilers?
A. Well, my knowledge of boilers and the way engineers approach issues.
Q. Okay. Were there any calculations that you performed in that case regarding heat transfer or heat flow or heat dissipation?
A. No.
Q. Have you ever -- okay.
Now, you said there was one more case in addition to those five that we've discussed within the last ten years.
What was that last one?
A. No. I think we've got all -- all six of them

now. The last two were the -- well, the E3 versus Biothane and then Young versus FirstEnergy were the two that I believe I left off of my report.

Q. Okay. Young versus FirstEnergy is actually in your report --

A. Oh, is it?

Q. -- as number four. Yeah.

A. Oh, hold that thought. Okay. Oh, I did. All right. I might have said six instead of five. It's five and not six. My bad. I apologize.

Q. Okay. During the last ten years, have you been retained by or worked with the Jones Day law firm?

A. This is the first time.

Q. First time. Do you know how you were found in this case?

A. I asked Mr. Bell when he was still working for Jones Day, and I believe he said to me they had -- knew -- somebody in Boston knew of me because I'm working on some steam litigation in Boston. And the person in Boston recommended me to Mr. Bell.

Q. Okay. You said you're working on steam litigation in Boston.

Is that ongoing?

A. It is.

Q. Okay. Have you provided any expert report or

testimony in that case?
A. I have.
Q. Okay. What is the name of that case?
A. That is -- did I do a report in that case? I need to make some notes.
Can I get something to make some notes, notes to self?
Q. Sure.
A. Yeah, that one --
Q. Do you need a piece of paper?
A. Yeah. That one -- oh, yeah, that one -- yeah, that one's -- that one's ongoing. Yes, that is E -- no, Level 3 versus Veolia. I do need to -- my apologies. Yeah, that one completely -- completely slipped through the crack.
Q. Are there any other cases that you are currently working on in which you have provided either a report or expert testimony?
A. Right now, I believe that's it. But let me -- let me reserve the right to check again and supplement because I don't want to leave anything out. So my apologies.
Q. With respect to the Level 3 versus Veolia, who is -- I'm sorry. Where is that case pending?
A. It's in Boston.

Q. State or federal court?
A. State.
Q. Do you know which court?
A. No, I don't.
Q. What is the subject matter of your testimony in that case?
A. Okay. In this particular case, there are steam lines running under the streets of Boston like there are in Ohio state. A lot of large northern cities have central steam plants with steam lines running underground.
And the issue at hand is there is heat damage to fiberoptic cables in -- hold on a second here -- fiberoptic cables and other telecom cables that have been damaged by the heat.
So the litigation is/was -- was/is Veolia the cause of the damage or are there other issues.
Q. Okay. And what analysis have you performed in that case with respect to your engagement there?
A. I am basically -- I'm saying that, yes, level -- or Veolia is responsible for the heat that's damaging Level 3's cables.
Q. Based on what?
A. My analysis of the system, looking at drawings, physically looking at the system, going into

manholes.

Q. Okay. Have you performed any calculations to arrive at that conclusion?

A. Did I do calculations? I don't think I've done any calculations in that one.

Q. How much heat is being transferred from the steam lines to the fiberoptic cables?

A. That's very, very difficult to determine and that's one of the issues, because their expert says it can be calculated and I have a different opinion because there are so many variables involved, it's virtually impossible to tell in that case, because they're buried underground, they've been there a long -- "they" being the steam lines, they're buried underground, they've been there a long time, it's in a big city, construction traffic, very congested underground utility area.

So there are so many assumptions that have to be made that an accurate calculation, in my opinion, is virtually impossible.

Q. Okay. So what are you basing your opinion that the steam line was the cause of the damage to the fiberoptic cables? What are you basing that on?

A. There's nothing else underground that produces heat. There are some infrared surveys that tend to buttress what I'm saying, and then the construction of the system and my knowledge of steam systems.

Q. Okay. The construction of the system, what about the construction of the system lends to your testimony in that case?

A. Say it again, please.

Q. Well, you said you were basing your opinion on the construction of the system in part?

A. Yes.

Q. What about the construction of the system have you relied upon in forming your opinion in that case?

A. The system there is predominantly a box trench where you have a steam line in a concrete trench underground. And if steam -- steam leaks into the box trench, that steam over time, it will -- it will condense. But as the box trench heats up, the heat will dissipate further and further away from the source of the leak. And the steam -- steam actually will travel along that box trench until it reaches an obstruction so that -- the underground area is going to get heated up, and then, again, that heat will dissipate from the box trench to the surrounding structures underground.

Q. Okay. And do you know how much is -- how much heat has been dissipated by that box trench?

A. I cannot cal- -- I mean, again, there are so many variables, it's impossible to determine.

Q. Is it heat or steam that is being shed into this box trench?

A. Yes.

Q. Both heat and steam?

A. Yes, sir.

Q. Okay. Is there a leak in the -- in the piping system that allows the steam to come out?

A. There was.

Q. Have you applied any formula, analysis or methodology in that case that you have similarly applied in this case? And by "this case," I mean Rossi versus Darden, et al.

A. Again, the same general methodology of looking at steam systems, engineering systems and analyzing the issues.

Q. So you've looked at the facts, you've considered the variables at play and then come to conclusions?

A. To the best of my ability, yes, sir.

Q. But in that case, in the --

A. Level 3 versus --

Q. -- level 3 versus Veolia case, you did not perform any type of calculation or any type of analysis applying principles or methodology to come to your conclusions?
A. I've done a qualitative analysis, not a quantitative analysis.
Q. And in this case, would you consider your analysis qualitative or quantitative?
A. Both. "This" being Rossi?
Q. Yes. Correct.
A. Both.
Q. Do you know who the attorney on the other side of the Level 3 versus Veolia case is?
A. No, I don't.
Q. When were you deposed in that case?
A. They're upcoming. I have not -- I provided a written report. I've not been deposed yet. And maybe that's the confusion. Maybe there was a understanding [sic]. I'm going to be deposed shortly in that case. But I have provided a written report, without a doubt. So maybe that was the source of my confusion.
Q. Did you bring a copy of that report with you today?
A. No.
MR. ANNESSER: Would you agree to supply us a

supplement with that copy of the report? It should have been brought today.

MR. LOMAX: Under what request number?

MR. ANNESSER: I'm not going to take the time. We'll go through it when we get off the record.

MR. LOMAX: I'm not familiar with it.

MR. ANNESSER: I'll -- we'll find it at the next break.

BY MR. ANNESSER:

Q. Okay. Now, the case of Bowe versus Conrail --

A. Yes.

Q. -- what was the subject matter of your testimony in that case?

A. A gentleman was -- I believe he was a janitor or custodian was stripping some floors in the Conrail facility and apparently some of the fumes from the chemicals he was using caused him some health issues.

Q. And your testimony was to -- was regarding the alleged improper ventilation of those materials?

A. That's -- yeah. That's my understanding, yeah.

Q. And you said you just learned for the first time today that you were refused as an expert pursuant to Daubert?

A. I knew there was a Daubert challenge. I found out from an attorney a while back. I did not know I had been refused. So Hackman screwed me yet today.

Q. Who's Hackman?

A. The attorney I was working for. He died.

Q. You say he screwed you yet again.

What was the first time?

A. He never paid me.

Q. Are there any other cases in the last four years where you prepared an expert report but did not end up testifying?

A. Again, let me -- let me look again, because I think there was some confusion on my part in the present time with the attorneys, so -- again, based on counsel. But let me look again. And if you'll tell me exactly what you want and the exact time frame -- again, I'm an engineer. I can read through these. I was kind of depending on them to help me. Again, not an excuse, but I will go through my records again, subject to counsel's approval, and we'll get this straightened out, if you don't mind.

Q. Well, I'm asking just from your memory right now.

A. I think -- I think that's it. Okay. Again, I can't be a hundred percent certain, but I think that's it.

Q. So there's -- there's not been other cases where you prepared a report but did not testify?

A. Well, there's been quite a few of those, but not in the last four years. Over the years there's been several of those, yes, sir.

MR. ANNESSER: Okay. If we can, we'll take a short break at this point.

THE VIDEOGRAPHER: We're off the record. The time is 10:34.

(Recess taken.)

THE VIDEOGRAPHER: We are on the record. The time is 10:49.

BY MR. ANNESSER:

Q. Sir, before we took a break, we had touched briefly on your retention in this case.

And I believe you stated that you were first contacted by Mr. Bell.

A. Yes, that's correct.

Q. What did Mr. Bell -- well, strike that.

What was your understanding of what Mr. Bell was asking you to do in this case?

A. My understanding at the time was that there was a steam boiler-related case in Miami area, and he had -- I had been recommended highly to him, and would I be interested in helping him with the litigation.

Q. What did you say?

A. Yes. Thank you.

Q. Okay. And what -- what did he tell you about the case? Did he --

A. It was just -- at the beginning, it was just very, very bare bones. And now I know, because of the confidentiality agreement and the intellectual property and so forth, he could not and did not say much, just kind of as generic as he could make it -- at least as generic as I think he could make it, let me say it that way.

Q. So what did he tell you?

A. You know, again, basically, you know, what I just told you.

Q. That there was a boiler-related case and --

A. Boiler and steam-related case, yeah.

Q. Did he tell you if there were any injuries relating to it?

A. No.

Q. Did he tell you what the subject matter of your expert opinion was going to pertain to?

A. Not at that time, no.

Q. But you told him, hey, sounds good, let's do it?

A. Yes, sir, that's what I said. Well, words to those effect, yeah.

Q. What was your next contact with anyone regarding this case?

A. I believe it was -- and that was -- again, my chronologies are always a little rough, but I believe he -- he contacted me, I think it was around mid-December of last year. And then, oh, within a few days of the end of the year, he said, hey, I'm going to be transferring over, leaving JD, going to Miller Friel. I'll contact you after the turn of the year after I get settled into the new firm.

Q. Okay. So when did he next contact you?

A. Oh, then it was sometime in early January, and then we started the discussions in earnest.

Q. Okay. What were those discussions in early January?

A. Then he started getting into a little more specifics of the case, you know, a little more -- a little more detail.

Q. What detail did he provide you?

Now, "early January," do you know approximately the date?

A. I'd say early/mid, 13th/15th, depending on

how you want to call it early or mid.
Q. Okay. So around the 13th/15th he contacted you regarding this case --
A. Right.
Q. -- and provided you a little bit more detail?
A. Right.
Q. What detail did he provide you at that time?
A. Just the fact that there was a -- now, he said that there was a device that it was allegedly producing more energy than it's consuming. And there are some issues about is this really -- you know, did it really do that, can it really happen.
Q. Okay. And what did he tell you he wanted you to do?
A. What he -- excuse me a second.
MR. LOMAX: I'm going to object to the extent you're seeking attorney work product.
MR. ANNESSER: Are you going to allow him to answer?
MR. LOMAX: Uh-huh.
A. He just said, we'll send you some documentation, take a look at it, see what you think. He did not -- he -- actually, he was pretty -- more specific than most attorneys about not saying, here's kind of what we want you to do. Take a look at this

stuff, let us know what you think, what your opinions are.

Q. What did he send you?

A. Actually, it was Mr. Lomax that then sent me a couple of flash drives with pretty -- a lot of the information that you have there in that whatever appendix it is, those -- those types of documents.

Q. Okay. Looking at Exhibit 7, which I believe you have somewhere here.

A. Oh, it's in my -- yeah, you were looking for -- I think you were probably looking for 4. Yeah, there's 4.

Are we still -- are we going to come back to 4?

Q. We may.

A. Okay.

Q. But looking at Exhibit 7 --

A. Yes, sir.

Q. -- take a look at the last two pages, which are marked as Exhibit B, and this document is your expert report in this case?

A. Yes. Okay.

Q. Is this a list of all of the information and documents provided to you in relation to your work with this case?

A. It looks like it, yes.
Q. Now, when were you formally retained in this case?
A. Okay. I'm having a hard time finding that document right now. I know it's in this stack of stuff somewhere. And I'm -- I guess for lack of a better date, I'm going -- for right now I'm going to say 20 January of this year-ish plus or minus a couple days. I know it's in here, but it's probably stuck between a couple of things.
Q. Okay. All right. I'm going to ask you to find that if you would.
A. Sure.
MR. ANNESSER: Why don't we go off the record for a moment to allow you to look for that.
THE VIDEOGRAPHER: We're off the record. The time is 10:56.
(Recess taken.)
THE VIDEOGRAPHER: We're on the record. The time is 10:57.
BY MR. ANNESSER:
Q. Sir, you found the document?
A. I did. My apologies. Yeah. Here's -- here's the signed retainer agreement.
Q. Do you have multiple copies, sir?

A. I do. How many do you need?
Q. I'm going to ask you for the copy you're referring to so I can mark it as Exhibit 8.
A. I think you've got the top one, but they're all the same, so you can mark whichever one you want.
- - -
(Deposition Exhibit 8 marked.)
- - -
Q. I'll tell you what, I will mark this one as Exhibit 8 and ask you to give me a copy of that.
A. Sure.
Q. Thank you. And I'll ask you to refer to this one specifically.
Now, this is a document that purports to have been signed January 25, 2017 by Mr. Pace?
A. That's correct.
Q. Prior to your retention in this case, did you do any work in the case?
A. No.
Q. So you didn't do any work before January 25th?
A. Okay. If you want to call a phone call work, yeah, I did a phone call.
Q. Other than the phone call?
A. No. As far as analysis and so forth, no, I

didn't do that.

Q. Okay. So were any of the documents listed in Exhibit B to Exhibit Number 7, your report, were those provided to you before or after your retention?

A. These two flash drives that I got from Mr. Lomax, I dated them. This one is dated -- they're both dated 24 January 2017. I wrote the date down of when I got them.

Q. Okay. So you received those prior to being retained in this case?

A. What's the date on that, the 25th?

Q. It purports to be January 25, 2017 --

A. Correct. I received them, I did not look at them. I probably loaded them on my computer, but I didn't really look at them.

Q. Okay. So you didn't review them prior to January 25th, 2017?

A. No. No. No.

Q. Is this fee schedule and conditions a standard form that you use?

A. It is. There was a little modification. It's my general form that I use. They wanted a little bit on paragraph 4 about the fee cap of $25,000. And then up in number 1, usually we don't add the case caption; in number 1, they added the case caption. So there were a couple of changes like that.

And then also about the confidentiality, they wanted to include that to make sure the confidential- -- "they" being JD and Miller Friel, so that I was tied into the confidential- -- confidentiality umbrella. There we go. And then other than that, it's my standard form.

Q. Okay. Did you sign a nondisclosure or confidentiality agreement in addition to this document?

A. I did.

Q. Do you have that with you today?

A. It's probably down in the Miami office of Jones Day. I signed it down there last week.

Q. So you signed it last week after you received all the documents that are contained on Exhibit B?

A. Wait a minute. Let me -- let me think about it here. I'm not sure if it was a confidentiality -- maybe it was a nondisclosure agreement. I did sign something last week with the anticipation of going on a site visit, so I did sign -- it was a -- I don't know. It appeared to be some kind of a legal protective document.

Q. Do you know what day last week it was?

A. I think it was Tuesday.

Q. Tuesday, February 21st, does that sound

right?
A. Sounds about right.
Q. So all these documents had been provided to you prior to that, prior to you executing that confidentiality agreement?
A. Whatever -- yeah, whatever that document was, that's correct.
Q. Other than the document you signed on February 21st, did you sign any other confidentiality agreements?
A. I don't believe I did. I don't think I did.
Q. So as of the time you entered into this fee schedule and conditions, that was accepted January 25, 2017; is that correct?
A. It is.
Q. The document that we've marked as Exhibit Number 8; is that correct?
A. It is 8, yes, sir.
Q. Okay. At the time that Mr. Pace executed this agreement, you had not begun any of the substantive work with respect to this case?
A. That is correct.
Q. Did you know at the time of entering into this agreement approximately what the subject matter of your testimony would be?

A. Very roughly. I knew it would be about the general area of boilers, steam, heat transfer. Very generally, yes.

And then also they had mentioned that the device claimed to have put out more energy than it consumed, so obviously that's -- that's going to be a matter of discussion, too.

Q. Now, looking back, sir, to Exhibit Number 7, which you've identified as your report in this case, did you prepare this report?

A. I did not. I prepared -- excuse me. I prepared a Word document report that is the bulk of this. All right. As far as putting it in the proper legal format, somebody at Jones Day did that. I gave them my report and then they put the -- you know, put it into proper format for the court.

Q. Okay. Is there any portion of the contents in here that you did not write?

A. Well, the cover page, obviously. Let's see here. On the first page, it would be like the top paragraph, the introduction.

Q. You did not write the introduction?

A. Actually, I did. Yeah, I wrote the backbone of that, yeah. And then --

Q. I'm sorry, you said you wrote the backbone of

that?
A. Well, you know, we -- obviously we've done a little bit of wordsmithing to get it in the proper legal -- you know, I'm an engineer, not an attorney, so, you know, it had to be gotten into the proper legal phraseology.
Q. You say "we" did some wordsmithing.
Who's "we"?
A. Well, you know, whenever -- as you well know, whenever an expert does a report, we'll go back and forth to try to get the wording in the proper legal phraseology.
Q. But my question was, who is "we"? Who did you work with to modify what you had written into --
A. Predominantly Mr. Bell.
Q. Mr. Bell?
A. Yes, sir.
Q. Was there anyone else?
A. I think Ms. Handelman was helping out a little bit.
Q. Okay. What about the Statement of Opinions, Equipment Description?
A. Okay, now, on page 1, I can cut to the chase here and save you some time here, through page number 23, that's all me.

Q. Were any alterations or changes requested by anyone in relation to any of the matters discussed in page 1 through 23 of this report?

A. We did some wordsmithing, yes.

MR. LOMAX: I'm going to object to any questions that are seeking attorney work product on this issue.

MR. ANNESSER: Okay.

BY MR. ANNESSER:

Q. You did some wordsmithing?

A. Yes.

Q. Okay. Do you know what areas were changed or altered?

A. Several.

Q. Do you know what those areas would be?

A. I don't remember exactly right now.

Q. Okay. We will go through this --

A. No. Again, to -- let me help you finish your question. Obviously page 24 I didn't do, because that's the attorneys and the service and so forth. The exhibits, you know, my CV, obviously, I did.

And then on the evidence reviewed, I think I told the people at Jone- -- yeah, Jones Day, because I think Ms. Handelman was doing a lot of this, I said, I'm -- I don't have time to write all of this down, what was on the two flash drives that Mr. Lomax provided. So they basically --

MR. LOMAX: I'm going to instruct you not to get into the conversations --

MR. ANNESSER: Well, he doesn't. He said documents that were provided by you, but --

MR. LOMAX: I'm just instructing the witness to not get into conversations with his attorney.

MR. ANNESSER: Okay. That's fine.

BY MR. ANNESSER:

Q. You can -- you can continue. I don't want to know what the attorneys have told you with respect to -- well, at this point in time.

A. Okay. What happened, instead of me typing out everything that was on those flash drives, somebody else did it, I checked it. It was just for purely clerical convenience on Exhibit B.

Q. Are there any documents that you reviewed or information that you received that is not listed within Exhibit B to Exhibit Number 7 that's been marked in this deposition?

A. Not that I can think of.

Q. Okay. In reviewing the documents that you were provided -- well, let me take a step back.

What was your understanding, at the time that you were retained, so as of January 25, 2017, what was your understanding of your assignment?

A. To look at the information that was provided and provide an independent analysis of were the claims being made for the device true or not, was the data -- did the data appear to be valid and -- let me get -- I got a little balled up there.

Would you mind asking your question again? I apologize.

Q. What did you understand your assignment to be?

A. Well, to look at, and again, is the coefficient of performance a proper term to use. Did the machine, the E-Cat, develop the COP that it was intended to do, did it produce more energy than it was consumed. And then also to kind of look at just the gen- -- the data that was -- that were -- data that were provided and to, again, try to make a general analysis of -- based on what I was provided.

Q. Now, sir, you said, I believe, that you had been retained 427 times -- or your company, ATE, has been retained 427 times of which 82 of those were in relation to cases pending before the courts; is that correct?

A. Not necessarily cases, expert witness. So a lot of them did not -- you know, a lot of them -- I shouldn't say a lot. Several of them have not gone to litigation. So I was involved early on with the anticipation of litigation and then they either settled, litigation was not pursued.

So those 82 that you're referring to are in the general legal purview as opposed to, say, doing design work or teaching work.

Q. Have you ever been fired by a client with respect to cases that you've been involved in --

A. Yes.

Q. -- as an expert witness?

A. Yes.

Q. How many clients?

A. One that I recall for sure.

Q. Okay. Who was that?

A. A long time ago, I think it was called Miller versus Dacor.

Q. Why were you fired?

A. Because I wouldn't rollover and tell him what he wanted instead of what I found.

Q. Okay. Any others?

A. That's the only one I can think of right now.

Q. So out of the 82 cases, there's only been one case where you have found contrary to the party that retained you?

A. That's the only one I can think of right now, yeah.

Q. Okay. So we're talking about your understanding of the assignment. And they asked you to evaluate a number of things, so -- and provided you information. Let's -- let's first review on Exhibit B to Exhibit 7 the documents that you've been provided.

You were provided a copy of the complaint filed in this action, correct?

A. Yes.

Q. Okay. That's number 1. Is there anything within the complaint that affected your evaluation in this case, that you relied upon in forming your opinions?

A. Let me take a minute and go through it. Okay. In looking at the -- what I have done -- at least -- I think that was a very long document, Article 71 of the complaint on page 13, by all accounts, the amount of energy produced by the E-Cat during the guaranteed performance was substantially greater than 50 times the amount of energy consumed, that was definitely part of it.

Q. Okay.

A. Next, 72, the ERV publishing his final report, yes. 73, yes. And then on validation of the plant on -- this is -- I'm not sure what -- this might be an addendum, but this was paragraph 4, validation of the plant. It looks like it's an attachment to the complaint.

Q. And what effect did those allegations have on your opinions in this case?

A. Well, those were -- those were the things that -- you know, a lot of the other issues were commercial and -- and so forth that did not concern my part of the work. Those appeared to be the -- the technical issues at hand that I could address.

Q. Now, number 3 on your list is the E-Cat MW1 Energy Plat in Miami Tests Plan.

Did you review that document, sir?

A. I did.

Q. Okay. And are you offering an opinion as to the propriety of that test plan?

A. I am.

Q. Okay. What have you been informed regarding that test plan?

A. Well, I was provided -- I've got a copy somewhere in here. I'm not sure I was informed much of anything.

I believe in discussions with Mr. Murray, he felt it was very, very deficient as far as testing and advice of this type.

Q. I'm going to stop you for a moment. You said in discussions with Mr. Murray, he felt it was deficient.

Did you do your own evaluation of the test plan?

A. Oh, yeah. Oh, yeah.

Q. And that evaluation was done for what purpose?

A. To determine if it was a proper way to test a device of this sort.

Q. Okay. And did anyone ever tell you in this case that the defendants, Ms. -- I'm sorry, Industrial Heat and IPH International B.V. agreed to that test plan?

A. They have, yes.

Q. They did tell you that?

A. They did, yes.

Q. Okay. So you were aware that that was an agreed-to test plan?

A. I am aware of that.

Q. And your opinion is that it is somehow deficient?

A. Correct, it is deficient, yes, sir.

Q. But you don't plan on testifying that it wasn't agreed to, right?

A. No. No. That's a nontechnical issue as far as I'm concerned.

Q. Okay. The fourth item on your list is initial queries for Mr. Engineer Fabio Penon -- or M. Engineer Fabio Penon as to measurements of the 1 megawatt plant.

Did you review that document?

A. I did.

Q. What was the purpose of your reviewing that document?

A. That was -- if my memory serves, that was Mr. Murray, Joe -- yeah, Joe Murray, his questions after his visit to the plant, his questions to Mr. Penon about things that were happening and -- and issues that they had -- Mr. Murray had questions or concerns with.

Q. Okay. And what was the -- well, did that affect your opinions in any manner?

A. I'd have to read it. Maybe if I can dig that out. It did to a point. I will say yes for now.

Q. Okay. And what effect did it have?

A. It just -- it gave me a little different perspective, a little more information to -- to consider.

Q. Did anyone tell you that they wanted you to testify in accordance with those queries?

A. No. Actually, they were -- they were quite specific that they -- at that time they known -- they knew that Mr. Murray had some -- done some analysis of his own. And they were very, very specific about not making me privy to those. They wanted me to come to my totally independent conclusions based on Mr. Murray --

Q. Then why did they --

A. -- or other than Mr. Murray.

Q. Then why did they disclose them to you at the same time as all the other documents?

A. You'd have to ask them that. I don't know.

Q. Okay. You just testified that they were very specific about not wanting you to --

A. That was at the initial -- at the onset of our -- my engagement. I should -- maybe I didn't clarify that one. It was the onset of the engagement.

Q. Well, I think we've established, sir, that you received these documents on January 24th and you were engaged on January 25th of 2017?

A. Right. But I also said that I did not do any work until after -- a day or so afterward.

Q. Okay. So approximately the 26th?

A. Ish.
Q. The documents produced in response to a subpoena served on Florida Power & Light --
A. Yes.
Q. -- did you do any analysis of those documents?
A. I looked at them. I don't believe I did a lot of analysis on them.
Q. Do you base any of your opinions on those documents?
A. Not right now, but I may, because I understand there's some more information coming from FP&L, so I do reserve the right to look at that again and supplement this if need be.
Q. You understand, sir, that your opinions have been submitted in this case and we're entitled to know what the opinions are prior to your deposition.
So are you inferring that you are going to be changing or altering your opinions after this deposition?
MR. LOMAX: Objection to the form of the question.
A. I may. Based -- as discovery continues, as I see other depositions and so forth, I fully reserve the right to amend or adjust my opinions based on that

information provided, yes, sir, I do.
Q. Do you plan on rendering any further opinions?
MR. LOMAX: Objection to the form of the question.
A. Again, I reserve the right to if need be.
Q. Okay. Currently, do you know of any additional opinions that you plan on rendering that are not reflected in your report?
A. Not right now.
Q. Documents produced in response to subpoena served on Miami-Dade Water and Sewer.
Did you review those documents?
A. I did.
Q. Did you review all the documents on this list, sir?
A. I did, yes, sir.
Q. Number 11 is a video and photo of the flow meter time lapse conducted by Joseph Murray.
Did you review that, sir?
A. I looked at it, yes.
Q. What is that?
A. There's some pictures that he took of the flow meter of the water coming back into the E-Cat. And he did a time lapse -- apparently did a time lapse

photo of the register dial indicating the amount of water passing through that meter.

Q. Okay. Do you know how much water was actually put through the meter in that test?

A. I don't remember off the top of my head.

Q. Do you know the methodology used by Mr. Murray in conducting that time lapse test?

A. Again, I don't remember right off the top of my head now.

Q. Did you rely upon that video and photo for any portion of your opinion in this case?

A. Very little.

Q. Okay. To what extent did you rely on it?

A. Again, very little.

Q. Well, I understand it's very little, but I want to know what that little amount is.

A. I can't give you a percentage.

Q. Okay. But it did affect your opinion in this case?

A. A little bit, yeah.

Q. Okay. The number 12, videos of heat simulation conducted by Joe Murray.

A. Yes.

Q. Did those videos affect your opinion in this case?

A. They did.
Q. Okay. More than just a little?
A. Yes.
Q. Okay. Do you know what criteria was used to perform those heat simulations?
A. No, I did not. I did not dig into his underlying methodology. I looked at them and that might be -- if I have time to look into it more, that be -- may be an area where I amend my opinion. If I have time to dig into Mr. Murray's analysis, I may agree or disagree with him.
I am not an expert on finite el- -- finite element analysis, all right, as Mr. Murray appears to be.
So, you know, I looked at it. It -- it appeared to be legit. But further examination, you know, there may be some -- some wrinkles in his analysis that I disagree with.
Q. Okay. So when you say "finite element analysis," what does that mean?
A. What -- in large scale analyses like that, what -- what an an- -- I can't even talk -- an analyst will do is to break a large system down into smaller chunks and then analyze each chunk and then anal- -- and then work that to analyze the aggregate. Some --

some problems are -- are very difficult to solve otherwise.

Q. So if the data under- -- underlying Mr. Murray's heat simulations was inaccurate, would that affect the opinion that you've rendered as part of this report?

A. If it was inaccurate, it might.

Q. What do you mean "it might"?

A. Well, you're assuming it's inaccurate. I don't know that -- you know, again, I --

Q. I'm asking you, if it's found that his simulations were, in fact, inaccurate, would that affect your opinions in this case?

A. I guess I'd have to ask you back, whose -- whose standard -- whose proof that it's inaccurate? I need to know, you know, who's saying -- who's saying it's inaccurate.

Q. Sir, it's not who said. I'm asking you, if you look at his underlying data and say, wait a second, this is all wrong, would that affect your opinion as it's been rendered in this report?

A. Would you help me out when you say "underlying data"? Can you be a little more specific, please?

Q. Well, the criteria that he used to perform

these simulations.
A. Okay.
Q. Do you know how these simulations are conducted?
A. I'm not -- like I said, I'm not an expert on finite element analysis.
Q. Okay. So you've relied upon his simulations in forming your opinions?
A. Yes, I have.
Q. Okay. Number 14, Joseph Murray's October 31, 2016 power analysis.
What was that?
A. He -- my understanding is what he did was to look at the -- the numbers generated by Mr. Penon and I believe Mr. Fabiani to compare those numbers with the FP&L meter data, that's my -- that's my understanding.
Q. Okay. Did you rely upon those comparisons in formulating your opinions?
A. Very little.
Q. But did you rely upon them to any degree?
A. A little. Like I said, a little bit. I'm not going to give you a percentage. A little bit.
Q. If that data were found to be incorrect, would it affect your opinion in this case?
A. No.

Q. Okay. Did you at all -- okay.
In your reliance upon Mr. Murray's October 31, 2016 power analysis, what relevance did that have to your opinions in this case?
A. Actually, not a lot.
Q. Number 15, photos taken at the Triangle Drive facility.
Did those photos have any effect on your analysis in this case?
A. Obviously, they had an effect. They were -- you know, there's no data there. It's information only. So, yeah, it did have an effect, qualitative more than quantitative.
Q. Okay. On the second page of Exhibit B, number 18, it says, Industrial Heat spreadsheets summarizing data collected from Florida Power & Light.
Who prepared those spreadsheets?
A. It says Industrial Heat, so it would -- you know, my understanding would be that they prepared the spreadsheets.
Q. Did you ever analyze the data to make sure that it was accurate and complete?
A. I did not analyze that electrical data at all.
Q. Did you rely upon that electric- --

electrical data in formulating your opinion in this case?

A. Virtually none.

Q. Number 19, Industrial Heat spreadsheet summarizing the data from Penon's final report.

What was that?

A. They -- they apparently -- what they did was they took his data and tried to translate it from Italian into English and make it so that it was usable for people who use English as their native language as opposed to Italian. That's my understanding of it.

Q. Did you rely upon that spreadsheet summarizing the data from Penon's final report?

A. I did to a point.

Q. How so?

A. I -- initially I thought that spreadsheet had been produced by Penon proper. And then it turned out that that was Industrial Heat's translation of it, if you will.

So I thought, now, rather than rely on this from Industrial Heat, I'll try to stick with the original data as much as I can.

So I looked at it initially, but then I don't want to say totally ruled it out, because, you know, it's already in my mind, but as far as a substantive

basis for my opinions, not very much.
Q. Okay. Now, Mr. Penon's final report, was that in Italian or was it in English?
A. It was in English.
Q. Okay. So what was the summary that Industrial Heat had provided?
A. This one? As best I could tell, it was a -- it was a rollup of the data, kind of a summarization of the data.
Q. Okay. Were they --
A. Go ahead. I'm sorry.
Q. Do you know if the -- the information input into that data was true and correct? Did you do an analysis to verify those --
A. Now, when you say "that data," help me out.
Q. The data input into the Industrial Heat spreadsheet summarizing the data from Penon's final report, do you know who put that in specifically into their summarization?
A. Into Industrial Heat's?
Q. Uh-huh.
A. I believe it was Mr. Murray. That's -- that's my understanding.
Q. Do you know --
A. But it might -- it might have been one of his

employees. That, I don't know for 100 percent.

Q. Did you cross-check and verify that it's accurate and correct?

A. That's why -- that's one of the reasons why I did not use it, because it was based on, what I understand -- because Penon's data was in a PDF as opposed to a spreadsheet, PDF is numbers on a paper, there are no underlying formulas that you can see on a PDF, at least not that I'm aware of. So my understanding is what Industrial Heat did was took Penon's data, replicated the spreadsheet and then input his data.

That's why I did not use Industrial Heat's, because it's a tran- -- okay, maybe not from Italian to English, but a translation from his PDF numbers into a spreadsheet.

Q. But the numbers should be the same, correct?

A. They should be, but they might not have been. You know, I think -- my understanding is Industrial Heat did try very, very hard. I understand Mr. Murray cross-checked almost all of them. But still, that -- that raises a question in my mind, so I didn't use them.

Q. Now, you say you --

A. I shouldn't say didn't, I used them very

little.
Q. You said it's your understanding that Mr. Murray cross-checked all of them.
What gives you that understanding?
A. I believe that's what he said or I read it someplace.
Q. Now, on number 20, telephone interviews with Mr. Murray --
A. Uh-huh.
Q. -- when did you first speak with Mr. Murray?
A. Okay. That would be January 20th of this year.
Q. And what was the purpose of that call?
A. That was an introductory call where Mr. Murray, Erika Handelson and Chris Pace brought me up to speed on what the -- what the substance of the case was.
Q. I thought you didn't know the true substance of the case until you were retained.
A. They got into more detail after I was retained. This was just kind of the basics, and then I got -- this is kind of the 30,000 foot, if you will. And then I got -- later on I got the -- from Mr. Lomax, all the nitty-gritty stuff, if you will.
Q. Other than the documents listed in Exhibit B

to Exhibit 7, which is your report, did you receive any other information, whether orally or in writing, email or otherwise that you relied upon in formulating your report?

A. Again, you have to include my education, experience and so forth. But as far as directly provided information, to the best of my knowledge, everything -- that's it.

Q. Sir, have you formulated any opinions in this case?

A. I have.

Q. I imagine you would have.

Are those the opinions that are summarized in your report on page 21, Conclusions?

A. Yes, it is, correct.

Q. In addition to those three listed opinions, have you formulated any other opinions in this case?

A. I think that's it as I sit here. I think we're pretty well good to go here.

Q. Other than the documents that we've discussed as part of Exhibit B to your report, are there any other documents that you have received but elected not to rely upon?

A. When you say "received" --

Q. That you were provided by anyone in relation

to this case that you did not rely upon.
A. Well, we talked about the Industrial Heat spreadsheet, all right, that I, you know, gave a little bit of -- you know, a little bit of credibility to, but no.
Q. Sir, going back to page 1 of your report --
A. Is that -- okay.
Q. -- under Statement of Opinions, Equipment Description, you state that you have not been able to inspect the E-Cat site in Florida?
A. Correct.
Q. Okay. But you state that based on the information provided to you, you believe the equipment is the E-Cat device invented by plaintiff, Andrea Rossi, a purported chemical processing/production facility run by J.M. Chemical Products or J.M. Products and related piping, electrical and -- equipment, utilities, et cetera, to support the two ventures. The author believes that the purpose of the E-Cat was to sell steam via Mr. Rossi's company, Leonardo Corp., to J.M.
A. Yes.
Q. Where did you get that information from?
A. It was provided by counsel.
Q. In what form?

A. Electronic and conversations and -- and documents.

Q. Would that be -- would the documents be contained in -- in the list attached as Exhibit B to your report?

A. Yes.

Q. What were you told in conversation regarding the two entities?

MR. LOMAX: Objection.

Are you seeking conversation with counsel?

MR. ANNESSER: I'm seeking anything that he was told.

MR. LOMAX: I object.

MR. ANNESSER: Any -- any information provided by counsel is not privileged to the extent that it had any relation to something in the report.

MR. LOMAX: If you're asking specifically about that, okay. Otherwise, I would object.

BY MR. ANNESSER:

Q. I'm asking what information you were provided with respect to the paragraph that we just went through by counsel.

A. One more time, please. I got lost in the back and forth.

Q. What information were you provided orally with respect to your statements made in the first paragraph starting on page 1 and carrying over to page 2 of your report?

A. Obviously, we've had a lot of discussions. I don't remember most of the conversation verbatim. But they provided some of the fill-in data as opposed -- about, you know, who did what to who, who J.M. was, who some of the players were, just, you know, kind of filling in some of the blanks, if you will, to give me a little more understanding or kind of the overview of the case.

Q. Now, sir, in the Background, Observations and Narrative, you say it's -- that it's the author's understanding is that the plaintiffs contend that the report dated 3-28-2016 by Dr. Engineer Fabio Penon is validation of the E-Cat's performance.

The purpose of the author's investigation -- that would be you, correct?

A. Yes.

Q. -- is to determine if the E-Cat data, in fact, produced more energy than it consumed as Mr. Penon reported.

Was that the purpose of your evaluation, sir?

A. Consistent with paragraph 1 and 2, or, yeah, under Introduction, again, looking at the document as a whole, yes.

And I would -- if you will indulge me, you asked me about my conclusions. I would add that there is another opinion that I have formed. Again, it was not included in my report. But based upon the ongoing work that I've done, I would add a conclusion number 4 that the E-Cat never produced superheated steam. And the E-Cat probably did not produce much steam, if any at all.

Q. Okay. We will come back to that.

A. I'm sure we will.

Q. Okay. The -- jumping ahead to the next section entitled Basic Thermodynamics, you go through -- well, let me ask you this: There's a lot of information that appears to be very generic in there.

A. Yes.

Q. Okay. Did you write that yourself, or did you --

A. You mean this section here? Absolutely, I wrote it.

Q. Did you borrow any of the language from any other source?

A. Well, the photographs or the illustrations, those come out of the slides I use for teaching. And then I reference Dr. Wark's book on thermal also.

Q. Now, you reference Dr. Wark.
Who is Dr. Wark?
A. Dr. Kenneth Wark, he was my thermodynamics professor at Purdue.
Q. What was the purpose to this generic again?
A. The purpose was is that if this is -- if this is indeed a jury trial or if it's a bench trial, regardless, the triers of fact are going to need to understand some basic thermodynamics to have an understanding of the real issues involved and the points I'm making.
Without that understanding, they are likely to be overwhelmed or confused with the issues, because engineering is somewhat like medical, you know, we have our own jargon and our own way of doing things and our own expert -- area of expertise that a normal person doesn't have.
Q. Well, let me ask you a couple things. Starting first with the first law of thermodynamics --
A. Uh-huh.
Q. -- what is the first law of thermodynamics?
A. The first law of thermodynamics, and this is quoting Wark and, you know, that's -- he writes very badly --
Q. I'm not asking you to read your report, I'm

asking you to tell me.
A. Oh, sure, certainly. The first -- the first law of thermodynamics is generally that energy can neither be created nor destroyed, it only changes form. And -- and also -- well, yeah, that's it.
Q. And there are many forms of energy, correct?
A. There are, yes, sir.
Q. Would you state that there are chemical, electrical, mechanical, nuclear, thermal, electromagnetic and so on?
A. And so on, correct.
Q. Now, on page 3 of your report, you go on to discuss and state that the energy forms are all interchangeable?
A. Theoretically, but go ahead.
Q. Okay. And you can convert one form of energy into another?
A. Theoretically.
Q. Okay. But then you state that nuclear energy is generally a one-way street?
A. Yes, it is.
Q. Why is that?
A. It's because -- again, I'm not a nuclear engineer, understand that. But to go from, say, mechanical energy to nuclear energy is typically not

possible. And I cited a nuclear weapon and a nuclear power plant. And usually with -- with nuclear energy, it's a one-way street outbound.

Q. What were you told of the E-Cat process?

A. That it is a -- not a nuclear reaction.

Q. Who told you that?

A. I read Mr. Stokes' report in which Mr. Rossi said that there's not a nuclear reaction involved.

Q. I'm sorry, Mr. Stokes' report?

A. The Florida radiological guy.

Q. That wasn't listed on the documents that you -- that are included in your report.

A. I believe it's in the -- I believe portions are in that 277-page response, and I'm not -- I can't look, I don't have all 277 pages of the third amended answer.

Q. Do you know what the nature of the reaction underlying the E-Cat is?

A. I do not.

Q. So as far as you know, it may be nuclear?

MR. LOMAX: Objection to the form of the question.

A. Again, based on Mr. Stokes' report, it does not appear to be nuclear.

Q. Okay. But, again, you're saying based on

Mr. Stokes' report.

What in Mr. Stokes' report indicates to you that it is not nuclear?

A. Okay. This is the 15 February '16 report of his, on the last line of item 20, Description of Investigation, he uses no process that generates ionizing radiation and uses no radioactive materials in the construction.

Q. Have you ever heard the term LENR, L-E-N-R, before?

A. I have.

Q. Okay. What does that stand for?

A. It purportedly stands for low energy nuclear reaction.

Q. Have you done any research on that subject matter?

A. Prior to this case, not much. I was -- I was vaguely familiar with Pons and Fleischmann when it happened, but I, you know, quit following it after the controversy.

Q. What about as part of this case?

A. Well, it -- Mr. -- what I do understand is that what Mr. Rossi is claiming kind of falls under the general rubric of LENR. But I believe that LENR is now a generic term as opposed to a specific term describing a specific phenomenon.

Q. Okay. And so other than Mr. Stokes' report which states that it does not use -- or does not emit ionizing radiation or use radioactive materials, do you have anything other than that to base your statement that it is not a nuclear reaction?

A. I believe that Mr. Rossi has stated that maybe in one of his depositions.

Q. Okay. Do you, sir, have any independent knowledge other than what you believe other people have said?

A. Well, when you say "independent knowledge," help me out here because this is an official report from the State of Florida, it's an official document.

Q. And it's somebody's interpretation. In our profession, we call it hearsay. Okay.

So what I'm asking you is, is there anything that you know that does not rely upon what somebody else says?

A. Well, I've not -- I've not been allowed to look at anything inside the facility. All right. I've not had a description of what is purported to happen, so I have not been allowed to get that far to make an independent determination yet.

Q. Would that be within your field of expertise

is to make a determination?
A. I believe I said already, I'm not a nuclear engineer, but I believe this is a non-nuclear device.
Q. Okay. Then what type of reaction may be occurring?
A. I have no idea. It looks like just a heat -- a thermal heat reaction on a glorified electric heater. I'm not sure that there's any reaction going on.
Q. Has anyone ever told you that samples of the catalyst had been taken were transmutation of the materials used appear to be indicated?
A. Appear to be? That's a little nebulous --
Q. What have you been told, sir?
A. I've not -- I've not been told anything in that regard.
Q. So you don't know whether there's been any transmutation or not? You don't know the nature of its reaction, correct?
MR. LOMAX: Object to the form of the question.
Q. And other than what you've read, you have no knowledge whatsoever or opinion with respect to whether it's nuclear or any other type of reaction?
MR. LOMAX: Objection to the form of the question.

A. Again, I'm not going -- I'm not going to agree to your assertion because Mr. Stokes was a Navy nukie, he's an official with the State of Florida, he is stating that there's no ionizing radiation, there was not a nuclear reaction.

And I read some other -- maybe it was him -- nuclear analysis that said if there were a nuclear reaction going on in there, it would be a very dangerous place for people to work.

Q. Okay. And what was that that you read?

A. Again, I read -- I've done a lot of Internet research, but I take that with a huge dose of scepticism.

Q. But you rely on it? But you still rely on it?

A. If I can -- if I can independently confirm it. You know, and just because it's -- oh, wait, no, I forgot, if it's on the Internet, it must be true, right?

No, I take -- I take a lot, particularly in areas like that, alternative in energy so for, there's a lot of quackery going on. I take all that with a huge, huge grain of salt, sir.

Q. What is Mr. Stokes -- what is the basis for his statement? Was there a methodology that he

applied?
A. He describes it in his report.
Q. Other than his description, do you know what he did or did not do to come to that conclusion?
A. How would I know if it's not in his report and I wasn't there?
Q. But I'm asking you.
A. I've answered.
Q. To the extent that you rely upon something, I want to know if you know what basis he had for his opinion.
A. What he put in his report, his experience as a Navy nukie and being a radiation safety officer for the State of Florida.
Q. Okay. So your -- your opinion with respect to whether it's nuclear or not is based solely upon the opinion that he's stated in that report?
A. And Mr. Rossi's statements, if I understand them correctly.
Q. Where are those statements?
A. I believe they're in one of his depositions.
Q. Okay.
A. And I -- and I believe he stated on the Internet that this is not a nuclear reaction. Again, there's so much stuff out there, it's hard to find it

all.
Q. Why isn't the deposition of Mr. Rossi contained within --
A. Well, because it wasn't taken until Friday. So, again, that's why, if you will notice in my report -- let me finish, please.
Q. Sir, there's no question pending. In fact --
A. Oh, I'm sorry. My bad. My bad. I stepped on you then. My bad. I apologize. I thought there was.
Q. My question to you, sir, was this: Your report was generated prior to Mr. Rossi's deposition, correct?
A. I believe, yeah, at least -- at least the one last Friday, obviously.
Q. So you would not have relied upon a statement by Mr. Rossi that was made allegedly after your report was?
A. Well, not at that time; I couldn't, obviously. All right.
Q. Now, sir, going through looking at page 4 of your report, which appears to be an image British thermal unit, did you create that image?
A. I did.
Q. Okay. And was it created specifically for

this or something --
A. No, as part of my training classes.
Q. Okay. This is just a generic image that you've created but doesn't particularly apply to this case, does it?
A. Well, yeah, it does particularly apply, because you're putting heat into fluids. So anytime you're putting a BTU in or out, yeah, it does apply.
Q. Okay. So was Dr. Penon's measurements in BTUs?
A. They were in watts and joules, I believe. It's an easiest enough conversion. Same stuff, just a different way to talk about it.
Q. Okay. But, again, this slide is particularly generic. It does not -- it's not an analysis that you performed on the E-Cat plant or the J.M. plant or that facility, correct?
A. But this is -- yeah, this is generic to any thermal system, so, yeah, it does apply to the E-Cat plant.
Q. Well, I understand. This is comprised of your experience and knowledge, is that fair to state, in terms of that's what this is? This is not any analysis that you've performed specifically for this case?

A. Well, yeah. Well, let me back up. This is -- this analysis is generic in that it applies to all thermodynamic systems. The E-Cat, regardless of whether we agree or disagree on most -- we're probably going to disagree on most everything, but I think we can agree that it is a thermal system of some type. So thermodynamics and these concepts do apply to it.

Q. Looking at page 5, sir, the first paragraph says, a conventional steam power plant might have steam leaving the boiler at a pressure of 2485.

A. Uh-huh. Yes.

Q. Is the E-Cat plant a conventional steam power plant?

A. It's not a power plant. All right. It allegedly produces steam. And, again, the purpose of this was not to talk -- this slide was not to talk about the E-Cat, per se, it was to talk about the more generally accepted way of producing power now.

Q. Where did you get this statistic that a conventional steam power plant might have steam leaving the boiler at a pressure of 2485?

A. My power plant experience. That's a typical number.

Q. Okay. Is that something I could look up online?

A. Sure. You know, if it's on the Internet, it must be true.

Q. And you talk about the gauge pressure has a local atmospheric pressure of normally 14.696 PSIA at sea level.

Is that something similarly that is widely known, or is that specific to this?

A. Yes. It's widely known, yes, sir. And it is specific to this case also.

Q. How is it specific to this case?

A. Well, it's in -- my next sentence says Think Miami. Doral, Miami, what, 41 feet above sea level, give or take, it definitely applies.

Q. Okay. You said 41 feet above sea level.

Where did you get that information?

A. That might be the elevation. I don't exactly what the elevation is. I used it as a number. It could be determined what the exact elevation is.

Q. Looking, sir, at pages 6, 7, 8 and 9 up until the point where it says E-Cat MW1 Energy Plant Final Report --

A. Yes, sir.

Q. -- would you consider that all generic as well? There's nothing specific to the facts in this case? Is that generic background?

A. It is generic and it is specific to the facts in this case in that thermodynamics applies to the facts in this case.

Q. Other than thermodynamics applying to the facts in the case, you go through a number of different examples. For example, on page 8, you have a place where it says at Leadville, Colorado, which is an elevation just over 10,000 feet.

We're not in Leadville, Colorado, are we?

A. No, we're not.

Q. That's just an example?

A. Correct, to illustrate a point.

Q. And where did you come up with that information, sir?

A. Well, I haven't been to Leadville, but I've been close. And so it's just -- it's an understanding that as you go up in altitude, the pressure drops. So I know, you know, Leadville, it's just a little over 10,000, so you can calculate the pressure and then the boiling point.

Q. Why did you choose Leadville?

A. Because it's, I think, the highest elevation airport in the country. I think it's one of the highest places that people want to live, just as an example.

Q. And this graph is predicated upon the information that you have above in the paragraph relating to Leadville, Colorado; is that correct?
A. Actually, it applies to the whole thing about boiling, saturated water, saturated steam, so it applies to that whole area.
Q. Who prepared this graph, sir?
A. I pulled it off the Internet.
Q. Okay. So you don't know who prepared it?
A. I have no idea.
Q. Do you know what website you got it from?
A. I don't remember. And the reason I picked it is it looked about like the best one that would rep- -- to illustrate what I was trying to -- to -- to talk about.
This is a very, very generic slide. There's dozens and dozens of different variations out there. I just happened to pick this one because it seemed to help my illustration the best.
Q. Sir, turning to page 9 at the bottom -- well, let me -- before I -- before I start into the report, let me ask you just generically, did anyone assist you in preparing this report other than counsel?
A. No.
Q. Did Mr. Murray assist you in preparing the

report?

A. He did not assist me.

Q. Did he request any changes be made to the report?

A. No.

Q. Did you make any changes predicated upon his advice?

A. No, definitely not.

Q. Did you make any changes predicated upon anyone's advice?

A. Other than wording changes and, again, in working with counsel to wordsmith the report, no.

Q. How did you decide on what data to review in this case?

A. Some of it's relevant, some of it's not. I looked at all of it. And let's use an example of Mr. Fabiani's electric data. All right. I looked at those computer files. Those looked like comma delimited files. I thought, okay, this might be nice to do at some later date, but I don't need it right now. So that -- that's one example of many decisions I made.

Q. Did you request any additional documents other than what was provided to you before rendering your report?

A. Request from counsel?
Q. From anyone.
A. I don't believe I did.
Q. Is there any additional information that you would have liked to have before rendering your report?
A. Not that I can presently think of.
Q. So sitting here today, there's no additional data that may have any effect on the opinions that you've rendered in this case?
A. I'm not going to consent to that at all. There may be a lot of data that I may need to look at and re-evaluate.
Q. Such as?
A. Well, again, I haven't been to the site, okay, so that's one thing. You know, there's potentially a lot of data there.
I have not been given, or at least I've not seen, the originals of Mr. Penon's data. All I've seen is a PDF representation of that. That could be quite useful. Those are two that I can think of off the top of my head. And, again, that is not an exhaustive list that I've given you, those are two examples of maybe a much larger list, sir.
Q. Tell me, sitting here, is there anything else that you would have liked to have reviewed prior to

rendering your report other than a site inspection and seeing Mr. Penon's original --
A. Again, not that I can think of now. But I'm not going to -- I'm not going to consent that that's my -- a limiting answer on my part.
Q. Did you ever request an original of Mr. Penon's data?
A. I believe I did.
Q. Who did you make that request to?
A. Either Mr. Lomax -- you know, one of the -- one of the attorneys that I'm working with, I don't remember who.
Q. Do you know if that was ever requested of Mr. Penon?
A. I don't know.
Q. What about the site inspection, when did you first request a site inspection?
A. I don't remember a date, but typically I like to do a site inspection, so I'm sure I mentioned it early on.
And let me -- let me go back, if I may go back. Going back to Mr. Penon's dep last week, as you well know, the record is going to be far from clear because of the issues involved, Mr. Pace may have requested that data during the deposition. I don't

remember for 100 percent. He may have. I'll have to -- we'll have to look at the record to sort that out. But Mr. Pace may have brought that up during his portion of the dep.

Q. Did you request Mr. Penon's data prior to rendering your report in this case?

A. I'm sure I did.

Q. Did you review any data that was provided to you by anyone other than counsel?

A. I don't believe I did.

Q. Did you review any literature or other publications that you used in rendering your opinion in this case?

A. Again, I can't give you a specific list. But, yeah, going back to my background, you know, the thermodynamics textbooks, things like that, yeah, generically, yes.

Can I give you specifics? Not right now, because -- like my steam tables, all right, I used those, okay, that's one example, Keenan and Keyes steam tables is one example. You know, my thermodynamics textbooks, those are a couple examples, but it's not exhaustive. So whatever I needed at the time, I grabbed, looked it up, put it back, went on.

Q. But you don't have a list today other than the steam tables?

A. No, but that -- no, but I'm not going to say that's a limiting list. Those are two I can think of off the top of my head right now.

Q. What did you use the textbook for?

A. The textbook?

Q. Yes.

A. Did I say thermal textbook? We'll just talk -- we'll just say Mr. Wark's book. You know, to make sure I'm clear on the -- on the first and the second law. And then to look up perpetual motion machines and see what he had to say about that.

Q. Perpetual motion machines?

A. Yes, sir.

Q. Is there a perpetual motion machine that you know of in relation to this case?

A. The E-Cat is alleged to be one. But in my opinion, it is absolutely not one.

Q. What is a perpetual motion machine?

A. One of the -- in reference to the subject at hand, a device that creates energy from nothing or creates more energy than it use- -- consumes or produces more energy than it consumes.

Q. So you have Mr. Wark's book.

A. Uh-huh.

Q. How did you rely upon the steam tables?
A. Well, that's -- that's where all of the specific numbers for steam properties are. Commander Data could memorize that, but I unfortunately cannot.
Q. Who published those steam tables?
A. Keenan and Keyes.
Q. When was that published?
A. I have no idea. I think it was the early '60s, my edition.
Q. Can you summarize the pertinent information theory or methodology from that publication that you used?
A. I don't follow your question.
Q. Can you summarize the pertinent information that you used from that document, from that -- the steam tables by Keenan and Keyes?
A. The properties of steam and the properties of saturated water and the properties of superheated steam.
Q. And what are those properties?
A. I can't give you numbers, that's why I have the book.
Q. Are those -- are all the numbers that you relied upon for -- contained within your report?
A. I use -- yeah, when I do steam calculations,

I use those steam tables, yes.

Q. What about the textbook by Mr. -- your prior professor, Mr. --

A. Wark?

Q. Wark.

A. Well, predominant -- again, looking at the definitions of first and second and then perpetual motion machines like we talked about.

Q. Okay. What about perpetual motion machines did you rely upon out of that textbook?

A. I can show you exactly what I looked at if you'd like.

Q. Sure.

A. Are -- are we done with the fee schedule and stuff so I can get this paper off of my stack?

Q. You can put it here for now.

A. Okay. Let me give you the -- do you have the -- okay, that's the exhibit, so all these other copies, I can -- I can get those off the table --

Q. Yes, sir.

A. -- and clean this mess up. Okay.

All right. Here are some extracts from Professor -- is that one or two copies? It doesn't make a difference. All right. And you can mark that one if you want because they're all the same.

- - -
(Deposition Exhibit 9 marked.)
- - -

Q. We will mark this document as Exhibit 9. And I'll have you refer to the marked document. If I may --
A. Sure. Absolutely.
Q. -- have a copy of this. Thank you.
So you referred, sir, to the provisions contained in Mr. Wark's book.
And Mr. Wark was the author of this?
A. Correct, he is.
Q. And you don't know when this was published?
A. I want to say late '60s, early '70s. I took thermo in, what was it, '73 or '74.
Q. Do you know if there are any publications that disagree with Mr. Wark's rules or information that he's provided?
A. There may be some publications out there that disagree with it. I'm not aware of them. But I know Dr. Wong fully agrees with him.
Q. Did you at all look for any information that disagrees with --
A. No, because I believe the laws of thermodynamics are inviable and there's no reason to

look.

Q. So you don't -- you don't know, sitting here today, whether anybody has challenged this publication?

A. I don't know for a fact. I'd be really surprised if somebody did.

Q. And specifically, sir, with respect to -- I know you said you looked at perpetual motion machines.

A. Correct.

Q. Can you summarize what information contained within this document you relied upon?

A. Yeah.

Q. I'm going to ask you -- I don't want you -- you can look at it. I don't want you to read it word for word.

A. Well, I won't read it. No, no, I won't do that to you. It's on page 213, 6-10. This is Wark's book. And then -- and then 214 describes -- yeah, page 213 and 214, Sections 6-10, perpetual motion machines, he gives me a general description of them.

Q. Okay. And did you find that -- did you use that description in any way in formulating your opinions in this case?

A. I did.

Q. Okay. How so?

A. If you go to page 214, middle of the page just above Heat Reservoir, the next -- the second sentence up, a perpetual motion machine, excuse me, of the kind -- first kind, a PMM1, in parenthesis, is a device which creates energy and thus violates the first law of thermodynamics. Any process which creates a PMM1 or a PMM2 is impossible.

Q. What is a PMM1 or PMM2?

A. Perpetual motion machine.

Q. What is the difference between 1 --

A. Okay. The difference, the first one is it violates the first law in that it creates energy. And then the second one violates the second law in that you can have a machine that basically keeps on running of its own accord.

Q. Now, we'll -- we'll get into the laws of thermodynamics shortly, but are you familiar with the author's reputation?

A. Dr. Wark? He was a good professor. I've never -- I've not heard anything negative about him. I mean, there may be negative stuff about him, but I have not followed his career, so I don't know good, bad or indifferent.

Q. Do you know if he maintains good standing in his field?

A. I don't know if he's even alive.

Q. Okay. What about Joe Murray, are you familiar with his reputation or experience?

A. No. I've never met the man.

Q. Do you know if this publication, specifically the Thermodynamics book written by Kenneth Wark, was peer reviewed?

A. I don't know that textbooks are peer reviewed.

Q. Now, with respect to your opinions in this case, can you state every methodology that you've relied upon in forming your opinions?

A. No, because -- and the reason for that is not that I don't have them, it's just that it's a thought process that I've developed over 40 years of being an engineer, four years undergrad, graduate degree, and everything that I've done. So it's just an ongoing process that it would take weeks to try to even sort it out.

I have one, but I can't give you -- unfortunately, I can't give you the specific answer that you're looking for. It's just it's in there and that's how I think and that's how I work.

Q. Okay. So there's no direct methodology you can point me to that, for example, Dr. Wong, our expert, can look at and say, yes, that methodology is correct, or, no, that methodology is incorrect based on --

A. Well, you know, when you say a methodology, you know, we can wrangle some words here if you'd like, but, you know, methodology seems to be more like in devising an experiment to figure out A, B or C. Okay. You know, here's the methodology, we're going to do this. All right.

My methodology is just a way of thinking that engineers typically use. I would imagine -- again, never met Dr. Wong either. I would imagine his thought processes along these regards and mine are probably quite similar, same for Mr. Wark, same for Mr. Murray. Okay. I should say Dr. Wark. My bad. You know what I mean.

Q. Is there -- so there's no defined, for example, formula that you have applied in formulating -- in formulating your opinions in this case? It's a culmination of your years of experience that you've relied upon in forming your opinions?

A. All of the above. I've used some formulas in talking about, you know, the heat rejected by a power plant, okay, that's a calculation. You know, the definition of COP, that's a calculation. All right. So there are formulas I used.

But, you know, your -- the answer to your question is yes. And not to be a wise guy, but it's a combination of both.

Q. And just to follow back through, the methodology that you have used in this case, have you ever -- or theories that you've applied in this case, have you ever published any material with respect to that methodology and these -- those theories?

A. No. The two articles that we talked about earlier, the only -- I shouldn't say that. I did write another article, I think, for a trade magazine about using contract engineers, but it has nothing to do with this case. Those are the only technical articles that I've written.

Q. Can you identify any literature that would support the theory or methodology that you've applied in this case?

A. The whole body of mechanical engineering work related to thermodynamics.

Q. But there's no specific literature that you would point me to?

A. I'm going to reiterate my answer, sir.

Q. Can you summarize, by any chance, that methodology or theory that you've applied?

A. I thought I just did.

Q. Well --

A. Forgive me, but I -- I thought I just did.

Q. Just that it is the -- the experience and knowledge that you've acquired over your --

A. And the training.

Q. And the training.

A. All of the above, yeah. I mean, it's -- you know, engineers think in a certain way. All right. You can ask -- again, to be a little wise guy, you can ask my wife, sometimes I drive her nuts because I'm so logical. All right. So engineers think in a -- you know, kind of an orderly -- what's the word? I don't want to say constrained, but, you know, a methodical, orderly manner.

You know, other people are more -- like artists are more free-form thinkers. All right.

Engineers and scientists and technical types tend to be more linear, step-by-step-type thinkers.

And, again, I know that's grossly general, but that's about the best I can do to give you a good answer to your question, sir.

Q. Can -- can your methodology or theory be -- is it possible that that methodology or theory could be falsified?

MR. LOMAX: Objection to the form of the

question.

A. No. The methodology, if it's blatantly fraudulent, it could be falsified. But, you know, we've all done litigation here in the room. All right. Experts can come to -- we all -- you know, the plaintiff's and defendant's experts come to different conclusions, generally speaking.

You know, if they came to the same conclusion, then the case settles. So, you know, people of equal training and so forth and integrity can come to quite different conclusions about the same facts of a case.

So I can't answer your question because, you know, honest people can differ on things.

Q. Does your methodology or theory have a known error rate?

A. How could it? It's qualitative, not -- it's quantitative in some regards, qualitative in another.

Q. Are you familiar with any dissenting views to the methods and theories that you've applied in this case?

A. Not that I'm aware of now.

Q. Are there certain types of questions that your methodology can't answer? For example, the causation of any of the facts that have been reported or testified to in this case or -- well, let me -- let me restate this.

Is there any type of question in this case that you do not believe your methodology can answer with respect to the operation of the E-Cat or the use of the steam, such as why certain measurements resulted in the way that they did?

MR. LOMAX: Objection to the form of the question.

A. Could you break -- break -- that's a little -- could you break that down step-wise for me, please?

Q. Okay. I understand that you believe that the E-Cat did not produce much, if any, steam?

A. Correct. Your understanding is correct.

Q. Does your methodology allow you to opine as to why the recorded results by various different equipment indicate that steam was created?

A. I would -- I would disagree with your contention that there may be recorded results. I'm starting to become of the opinion that the numbers were manufactured and not necessarily genuinely and legitimately recorded.

Q. Okay. We'll -- we'll go through that.

A. I'm sure we will.

Q. Do not worry.

Have you ever worked with LENR projects prior to this case?

A. No, sir.

Q. Have you ever reviewed test plans prior to this case for LENR technologies?

A. Not for LENR, no.

Q. What about other power plants, power producing plants?

A. Yes, I have.

Q. Okay. In what context?

A. When we put the coal-fired boiler in at Ohio State University, I was -- I was the backup engineer on that. There was an older engineer. He was the prime on that one. I was the prime engineer on the steam line that we talked about earlier.

So as a part of that closeout process after the boiler was built and up and running, we used the -- and, again, this is an old version of it, but we modified an ASME, American Society of Mechanical Engineers, they call them performance test codes now, but we took this, modified it to our own use to actually determine what was the boiler doing. And we did a similar thing for the generator. We measured the steam input, the temperature, all that other stuff, measured the electrical output so that we'd have an accurate determination of the efficiency of the boiler and the efficiency of the turbine generator.

Q. Okay. So -- and let me kind of circle back around because maybe I don't understand how boilers work.

But from the 10,000 foot level with a boiler --

A. Sure.

Q. -- is it generating energy?

A. It's -- a boiler -- all right. A boiler is kind of like an automobile. All right. Our car -- because everybody is familiar with a car, that's why I often use automotive analogies when I'm teaching. A car has got a motor, it's got doors, a hood, seat, a fuel tank, drivetrain, tires, brakes, all that stuff. All right. Collectively we call that a car or an automobile or truck, whatever vehicle. All right.

A boiler is the same in that semantic regard. A boiler has lots of different components. It's got a burner, it's got a control system, it may have an ash removal system, it's got a draft system, fans, all those other systems that we collectively call a boiler. Okay.

So the burner itself, the burner is the, what I call the front end of the boiler. The burner converts -- and, again, let's just use a gas-fired boiler. All right. A burner is the energy conversion device that takes the chemical energy in the fuel, converts that to heat energy in the form of a flame, and then hot gas when the flame burns out, and then that hot gas passes through the boiler.

What we call the boiler proper is actually a heater exchange then that extracts heat from that gas, puts it into the water.

That's why my answer early in the deposition about heat exchangers, a boiler, technically, is a heat exchanger. Okay.

And then in the case of like the boiler here at OSU or big utility units where we need superheat, then the steam will actually leave the boiler itself, the boiler steam drum, and go to a separate set of tubes called a superheater, which then adds heat over and above the saturation temperature of the steam to put hot dry steam into the turbine.

Sorry about the long answer, but that was about as short as I could make it, sir.

Q. So in summary, a boiler does not generate energy, it -- it consumes it and transfers energy from one point to another?

A. Right. But the boiler -- and let me -- let me break your question down, if I may, to help you. The boiler proper is the heat exchanger. It absorbs heat and then transfers it from the gas to the water. The burner is actually the energy conversion device.

So if you take the two as a whole, you are correct. We're bringing in chemical energy, whether it's coal, gas, oil, whatever it might be, converting that energy into heat and then putting in the water to do something useful with it someplace else.

Q. Now, have you ever worked with an energy generation plant, a plant that generates energy as opposed to transfers energy from one form to another?

A. When you say --

Q. Well, let me --

A. Help me out, please.

Q. Have you ever worked in a nuclear power plant?

A. No, I've not.

Q. Okay. To your understanding, sir, how does -- understanding the first law of thermodynamics that energy can neither be created nor destroyed --

A. Right.

Q. -- how does that work with a nuclear power plant?

A. Again, I'm not a nuclear engineer, but my --

and, again, this is where I believe Dr. Wong is at variance with Dr. Wark, but I think -- I believe even Dr. Wong thinks that nuclear plants do not necessarily obey the first law. Okay.

Having said that, my understanding is you take a more fissile form of -- it's usually uranium, like 235 typically, and then that energy that's in the atomic structure as opposed to the molecular structure breaks down into heat as it decays, and then that heat is used as the heat source for the boiler. So we're going from a more concentrated energy source and then into a lower energy source.

I believe -- and, again, not being a nuclear engineer, but I believe that there's still -- you know, instead of using -- let's just say to generate a certain amount of power, instead of using a gazillion tons of coal, a nuke plant might use a hundred pounds of uranium fuel or a ton of -- you know, whatever. Okay.

So the energy form is much more concentrated, but I don't believe that nuclear plants are capable -- and I could be wrong, but I don't believe nuke plants are capable -- I don't believe they violate either the first or the second law.

Q. What about -- what about chemical energy, how

-- how does chemical energy -- chemical energy plants, either coal or otherwise, how does that work?

A. Again, you're just taking the chemical energy that's combined in the fuel -- that's contained in the fuel and then releasing that in a combustion process to reduce -- release that chemical energy that's within the molecular bonds.

Q. Okay. So when you're considering the efficiency of whether it be a chemical plant or a nuclear plant, you consider the amount of energy it takes to enable this reaction to occur, correct?

A. Yeah. I think if I'm understanding you correctly, yeah.

Q. And you compare that with the amount of energy that is released either by the chemical process, or in the case of a nuclear plant, by the decay of the atomic matter?

A. Help me. Could you break that down? I'm --

Q. Well, considering the first law of thermodynamics --

A. Okay.

Q. -- I mean, it can never be created or destroyed?

A. "It" being?

Q. "It" being energy.

A. Correct.
Q. Okay.
A. And matter and energy can neither be created or destroyed, they only change form.
But go ahead, my apologies.
Q. In a nuclear power plant, you would agree that the energy required in a plant to operate, turn the lights on, turn the machines on, put the control rods in, et cetera, is less than the amount of energy that is put out by that plant, correct?
A. Oh, yeah, yeah.
Q. Substantially less?
A. Oh, yes. Yeah. It's called parasitic power, but yeah. And that's true -- that's true of any power plant. You need a certain amount of power to run the fans. Like you say, all that power that's required to run the plant is subtract- -- again, depending on where you want to draw the boundary of where -- how you define the efficiency, and that could be a long discussion, too, but, yeah, that -- that energy is -- has to be consumed to run the plant, you are correct.
Q. Okay. So in that case, for example, a nuclear power plant, the amount of energy input into this facility, I'll call it Turkey Point down in Miami --

A. Okay. Sure.
Q. -- or otherwise --
A. Yeah.
Q. -- the energy going into the facility is substantially less than the energy coming out of the facility, correct?
A. When you say the energy coming in, meaning the energy released by the reaction? Help me out here.
Q. That's the energy going out.
A. So are you -- when you say the energy coming -- the energy coming in, the energy is contained in the fuel rods.
Q. Okay.
A. In the fuel. Okay.
Q. Okay. Go ahead.
A. Please run that by me again one more time. I apologize.
Q. I tell you what, we'll come back to it.
A. I apologize.
Q. We will come back to it. I'll tell you what, I don't want to spend too much time.
A. I apologize.
Q. Did you perform any tests or simulations of your own with respect to any of the facts or opinions that you've rendered in this case?

A. You mean in tests as in physical -- like metallurgical or anything like that, no, sir, I did not, although I do -- do reserve the right if, you know, if need be.

Q. Okay. Does your report contain the complete basis of and reasons for your opinions stated therein?

A. It does at the time of the report. Other information has since come in. And, again, that's part of why I keep making this caveat about, you know, information coming in and me possibly modifying my report.

But at -- at the time it was written with the information I had, I stand by it.

Q. Okay. Is there anything that you would change sitting here today regarding your report?

A. Well, again, you know, I did not add that I don't believe -- in the report I didn't say that I don't believe that it was producing -- not producing steam.

Did I say that clearly?

I did not opine that the E- -- I don't believe the E-Cat is not -- the E-Cat is not producing steam, in my opinion. There we go. All right.

Q. Were you aware that Mr -- Mr. Stokes, who testified in this case, testified -- in fact, you've relied upon his testimony, that he testified that he was there when there was a minor steam leak?

A. Well, I read that. And the thing is, even 200 degree water will vapor and produce vapor. And so if he saw a steam leak -- and, again, he was a nukie in the Navy. He understands steam reasonably well, I would understand, there may have been very, very hot water that when it leaks out, it's going to give the appearance of a steam leak, and that's what he may have thought was going on.

Again, you know, he was there to do a radiological study, not necessarily a steam system survey like I do on a semi-regular basis.

Q. So he couldn't tell the difference between water in a gaseous form as opposed to water in a liquid form?

MR. LOMAX: Objection to the form of the question.

A. I -- run that by me again.

Q. Well, you said the water could have been releasing in a man- -- in a manner that appeared to be steam?

A. Well, steam is invisible. You can't see it. Water vapor, condensed steam you can't see. You cannot see steam. And not only you, nothing personal, nobody can see steam. So he may have very well seen vapor, which he called steam.

Q. Within your report of the opinions that you've expressed, are there any that you would change or retract from?

A. Nothing I would retract. I would amend it as we've talked about, but nothing I would retract right now, no, sir.

Q. Other than Dr. Penon's original form -- I'm sorry, original spreadsheet and the site inspection, is there any further research that you would find desirable?

A. At this time, no. But, again, if it needs be -- if -- if based on other -- those issues, yeah, I reserve the right to -- to do more, if need be.

MR. ANNESSER: It's 12:30. We've reached a good stopping point for the moment.

THE VIDEOGRAPHER: Off the record. The time is 12:26.

\- - -

Thereupon, the luncheon recess
was taken at 12:26 p.m.

\- - -

February 27, 2017
Monday Morning Session
1:13 p.m.
- - -
THE VIDEOGRAPHER: We are on the record. The time is 1313.
BY MR. ANNESSER:
Q. Sir, before we took a lunch break, we were going through your report.
And do you still have that in front of you?
A. I do, yes, sir.
Q. Okay. If I could ask you to turn to page 9.
A. I'm there.
Q. Okay. Looking at the first paragraph on page 9 of the section entitled E-Cat MW1 Energy Plant Final Report --
A. Yes.
Q. -- the last sentence in that paragraph I believe states that Penon is referred to as the expert responsible for validation in various documents, and will be referred to as such, although the author expresses no opinion on whether Engineer Penon was the ERV as specified in the parties' contractual documents.
Do you see that?
A. I do.

Q. What was the purpose of that statement?
A. Let's see, looking at various documents -- yeah, at that time, I had not -- and I don't think I've seen -- whatever contract documents I had seen were in the complaint and the third supplemental. So I didn't know for a fact that, you know, in the documents themselves whether Penon was specifically designated.
So I -- I didn't know, so I just kind of put that in as a cover-my-backside statement so that if he was, in fact, I was -- you know, I was okay. If he wasn't, I was okay. I just want to kind of preserve that.
Q. Did anyone tell you that that was an issue in this case?
A. I -- I think they mentioned it in passing, but they didn't -- you know, they didn't make a big deal of it, so I -- you know, I just kind of didn't pay a lot of attention to it.
Q. Turning to the next page, page 10, sir --
A. Yes.
Q. -- you state on the beginning, this author's search of the Internet reveals a prior relationship between Dr. Penon and Mr. Rossi. If true, this author wonders how Dr. Penon could have been an objective, dispassionate third-party verifier.

A. Correct.

Q. What is the relationship that you have uncovered on the Internet?

A. Well, again, there's a lot of stuff in the LENR world about them. And then, you know, on the Internet, I had observed that they had done some work together, I don't remember the date, prior to this particular project. Okay.

Q. Do you know if Industrial Heat or IPH International B.V. were aware of the prior relationship?

A. I do not know that. And, actually -- and, again, it was after the fact of my report, obviously, but last week, Dr. Penon pretty much admitted to that, too, under questioning.

Q. Okay. Does that affect your -- did that information or your belief that there was a prior relationship affect your report in any manner or your opinions?

A. It -- it would -- it would make me tend to look at his data more skeptically than if he had just been, I say -- forgive the phrase -- some guy off the street. But an independent party that had no prior relationship with either Mr. Rossi or anybody, he was just a totally independent expert that had come in to

do the numbers and runs the tests and so forth.
Q. Is it your opinion that the prior relationship between Dr. Rossi and Dr. Penon, if any, has somehow caused there to be -- well, somehow affected Dr. Penon's reporting in this case?
MR. LOMAX: Objection to the form of the question.
A. Obviously I cannot speak to that because I don't know the relationship and so forth. But for my -- my perspective, it -- it casts a bit of a shadow on the results, if you will.
And, again, you know, everything may be on the up and up. I'm not willing to concede that. But the fact of a prior relationship, in -- in my opinion, tends to lessen my belief in Dr. Penon's total objectivity.
Q. Have you ever worked with any attorneys in the capacity of an expert witness more than once?
A. Oh, yes. You know that, yeah, I have. Oh, wait. I'm sorry. You mean with the same attorney?
Q. Yes.
A. Yeah, Mr. McLaughlin. The guy that Dauberted me, yeah. Yeah, I worked for him twice and then he ran the Daubert challenge on me.
Q. Is -- is the work that you've done for him

more than once suspect because of your prior relationship?

MR. LOMAX: Objection to the form of the question.

A. I don't think it is. But, again, somebody in your position may -- may -- you know, may want to question that.

Q. Do you have any other repeat clients?

A. I think he's the first one, the first and only, I believe.

Q. So you've got no other clients who have used you and then used you again for another project?

A. Now you're talking expert witness clients or --

Q. Either.

A. -- engineering?

Q. Either.

A. Oh, yeah, I have a lot of expert repeat business, yes. Volcanic has used me a lot, Damon Engineering has used me a lot. Yeah, so I have lots of repeat business, yes.

Q. Is your work for repeat clients any different than your work for new clients in terms of the accuracy of your reports?

A. No. No. I try to be, you know, down the line and objective and correct as I can, and accurate.

Q. So the fact that Dr. Penon had previously tested the E-Cat device does not invalidate his final report in this matter in and of itself?

A. In and of itself, maybe, maybe not. I'm just saying it raises a question in my mind.

Q. Well, maybe, maybe not.

How would it invalidate the test that he had done a prior test on the --

A. I don't know the nature of their relationship. That's the point. You know, my relationship with my clients was purely business. Okay. I do not know the nature of their relationship. So depending on what it was, it could or could not have an effect on it.

Q. What methodology or theory did you use to come to that conclusion?

A. Well, there's no methodology or theory, just does it pass the smell test or not.

Q. Now, I'd like to ask you for a minute about what you're not opining to. Okay.

Are you opining to issues regarding the test protocol, whether the test protocol was proper?

A. I am opining to that, yes.

Q. Are you opining to any issues regarding the adherence to the test plan?

A. I am.

Q. Adherence?

A. Yes.

Q. Okay. And what is your opinion as it pertains to adherence to the test plan?

A. I'm not -- depending on some words and so forth, I'm not sure that Mr. Penon totally adhered to it.

Q. You're not sure?

A. Correct.

Q. Are you offering an opinion as to whether he did or did not?

A. Well, let me elaborate a little if I may. There's some -- and I didn't -- I did not delve into this, again, because of time constraints.

My understanding was at the beginning of the test, that this test was to be run with all of the units or modules running. At some times throughout the test, various modules were shut off. That would appear to us on the surface to be a violation of the -- of the protocol.

Q. Sir, looking at page 10 of your report, it states, defendants' third amended answer, additional defenses, counterclaims and third-party claims identifies many issues regarding the test protocol, adherence to the original test plan, number of cells in service, related issues. Due to time constraints, the author will not address these issues in this report --

A. Continue, please.

Q. -- but reserves the right to address them in the future.

A. Yes, sir.

Q. So do you believe it fair to tell us that you will opine to this later, but cannot tell me right now or could not tell us at the time of --

A. It is fair, yeah, because like I said, I did not and I still have not had time to opine to that.

Q. Okay. And you can't tell me what your opinion is at this point in time?

A. Not with any specificity, no, so I will not opine.

Q. Okay.

A. But I still reserve the right to.

Q. The court determines what you are permitted to opine to within its realm, but you're certainly entitled to any opinion you may have outside of the court.

MR. LOMAX: Objection.

Q. Are you opining as to how LENR works?

A. No, I'm not. But let me, if I may, get back to a question you asked before lunch. And while I was trying to take a nap, your question was rattling around in my brain.

And your question was to the effect, does a conventional nuclear plant produce more energy than it uses. And I hope I'm not misstating your question. If I am, please stop me now.

Q. Well, there's no pending question, but --

A. Okay. If I'm assuming -- if I heard your question properly, the answer to that -- that narrowly -- and it appears -- and, again, no offense intended, that you might have been conflating terms. And let me -- let me use a quick numerical example, if I may.

Let's say a conventional nuke plant produces 1050 megawatts. That would be its gross electric -- and when I say -- I'm talking electric megawatts, not thermal, okay. It may have an internal usage of 50 electric megawatts, again, for pumps, fans, controls, rods, blah, blah, blah, so it has a plant net output of a thousand megawatts electrical. Okay.

Now, the reac- -- and, again, not being a nuclear engineer, but the reaction that is going on inside the reactor may be -- and, again, this is just an example for illustration -- may be producing 2500, 3000 thermal megawatts to generate one hundred -- or 1050 megawatts of electrical power. The balance of that thermal energy generated is going to the cooling tower.

So the efficiency, if you will, of a conventional nuclear plant is still going to be on the order of 35 to 40 percent because it is using more thermal energy from the nuclear reaction than it is producing, if I'm making sense.

If the nuclear reaction generates, let's just say 3000 megawatts of thermal heat, the plant is producing a thousand megawatts of electrical, then the rest of that heat has to go to the cooling tower. And every conventional nuclear plant has a cooling tower to get rid of that waste heat. So the conventional efficiency of a nuclear power -- or conventional nuclear power plant is always less than unity.

Q. Okay. How much energy is generated by the reaction taking place in the E-Cat?

A. You mean how much energy -- are you asking me how much energy is the E-Cat putting out? Is that -- is that your question?

Q. No. I'm asking you, how much is generated?

So, for example, in the example that we were just discussing where the plant put out 10,050 megawatts --
A. Right.
Q. -- and it consumed 50, correct?
A. Well, when you say "consumed," yeah, parasitic power. I call it parasitic, but, yeah.
Q. Parasitic power of 50?
A. Uh-huh.
Q. Okay. What would the numbers be for the E-Cat?
A. I don't know.
Q. Do you know what type of reaction is taking place there? I believe I asked you that before.
A. Uh-huh. And, again, I do not know. What I believe it to be is just a conventional electic -- electric resistor reaction.
Q. Have you seen any plans for the E-Cat?
A. I've got a drawing I pulled off the Internet. I don't know if they're plans, but I've seen something that appears to show what the E-Cat looks like.
Q. Where did you get that drawing? Do you have it with you?
A. I certainly do.
Q. While you look at that, have you reviewed Dr. Rossi's patent?

A. His?
Q. Patent.
MR. LOMAX: Objection to the form of the question.
A. I looked through it. I did not study it. I scanned it. Thank you.
Q. All right. You know what, I'll move on.
A. I know it's in here, yeah. It's in the stack.
Q. Something you pulled off the Internet, though?
A. I did. And it purports to show a cutaway of the E-Cat. And I think the fellow's name that did it was Bob Higgins, who I understand to be -- that have worked with Dr. Rossi on other projects. Again, that may not be true, but right now I believe that to be the case.
Q. Did you -- did you rely upon that information in formulating --
A. No. I just -- I just found that out recently.
Q. Okay. So you're not going to be testifying as to the nature of the reaction that's taken place?
A. Other than the fact that I don't believe it can produce more energy than it consumed, I will --

that I'm not going to back off from, sir. Okay.
Q. We'll come back to that.
You're not also testifying regarding the fact that a heat exchanger would have on heat transfer at the Doral facility; is that correct?
A. Say again, please.
Q. Are you aware, sir, that there was a heat exchanger at the Doral facility?
A. Where?
Q. Are you aware of that? Did anyone tell you that, sir?
A. I've been told there have -- there's multiple heat exchangers, so that's why I'm saying where. I'm not trying to be difficult. I need to know which one.
Q. Okay. What have you been told?
A. Well, I've been told that there was one in the black box, I've been told there was one in the mezz and --
Q. And the mezz, what's the mezz?
A. Mezzanine, the area over the office.
Q. The second floor?
A. In the front of the -- and, yeah, second floor in the front of the building.
Q. Okay.
A. And actually, the E-Cat itself is a bit of a

heat exchanger, because you -- again, regardless of the technology, putting the technology aside, the E-Cat is giving off heat. We will agree to disagree of the manner thereof. Okay. But then that heat-by-heat exchange process goes into the water to heat it up.

Q. Okay. Are you opining as to the dissipation of the heat being generated by this system and where that heat could have gone?

A. Or not gone, yes.

Q. Or not gone. Okay. Did you perform any calculations to determine how much heat could have been dissipated by the heat exchanger in what you called the mezzanine, the second floor?

A. Well, A, I'm not sure that that heat exchanger ever existed because I have no pictures of it, I have no drawings of it, I have no calcu- -- calculations prior to Dr. Wong's report.

Two people claim to have seen it, so I'm not sure that it even exists, so it's going to be hard for me to answer your questions with any specificity on a device that may or may not have existed.

Q. Okay. So you said you haven't seen any pictures of it.

Did you ask for pictures of it?

A. Who would I ask, Counsel?

Q. Anyone.
A. I probably did. You know, I can't say for sure, but I said, well, show me something.
Q. Okay. Did you ask for any drawings of it?
A. Again, something would incorporate everything that I've referenced here, sir.
Q. Did you ask whether there was a heat exchanger on the site at all?
A. Who would I ask?
Q. Counsel, anybody, Mr. Murray.
A. I believe -- I probably -- I think I did ask Mr. Murray. But, again, nobody on our side has been allowed into -- into the gray wall, so we wouldn't -- our side -- I say our side -- how would we know, because we've not been allowed access to it, if it existed.
Q. So your assumptions are all based on the fact -- your opinion is entirely based on the assumption that there was no heat exchanger; is that correct?
MR. LOMAX: Objection to the form of the question.
A. It's not an assumption that there was no heat exchanger. There's never -- there was no heat exchanger mentioned until after my report came out,

which I find a little suspicious, quite frankly, sir.
Q. There was no heat exchanger mentioned to you?
A. Correct.
Q. Okay. But you don't know whether there was one there or not?
A. I'm going to assume there was not until I see some hard evidence of it.
Q. Okay. And the testimony of witnesses isn't sufficient for you?
A. Let's see, considering that one of them is Mr. Rossi and one was Mr. Bass, yeah, I'm a little skeptical of that, sir, with all due respect.
Q. Okay. So you're basing your opinion on that matter, the fact that there was no heat exchanger, on -- on your evaluation of their testimony?
A. I'm not saying there was no heat exchanger at this point. I'm saying I'm from Missouri, show me, please.
Q. Okay. Have you been selected as a juror in this case?
MR. LOMAX: Objection to the form of the question.
A. What's your question mean?
Q. Well, I'll retract it.
Would you agree that if there was a heat

exchanger, sir, that it would, in fact, negate some of your opinions as set forth in your report?

MR. LOMAX: Objection to the form of the question.

A. Absolutely not.

Q. Your -- your report was predicated upon the assumption that there was no heat exchanger, correct?

A. Correct.

Q. Okay. So if there was a heat exchanger, there would be different variables that you had not accounted for in this report, correct?

A. I -- I can't answer that. Knowing nothing about it and -- and a heat exchanger, even if it's installed, may not work. There may have been a heat exchanger there; it may not have functioned.

Q. But you don't know one way or another. If there was a functioning heat exchanger there, sir, would that change the findings in your report?

A. It may, it may not. It probably will not.

Q. Why is that?

A. Because, again, I don't believe it was there, based on my understanding of thermodynamics and what I have -- what pictures I have seen of the facility, I have no reason to believe that it was there.

Q. Well, I'm asking you to assume, sir, that it was.

A. I'm not taking that assumption. Sorry.

Q. Okay. Are you making or giving any opinion as to whether this was the guaranteed performance test required under the parties' contract in this case?

MR. LOMAX: Objection to the form of the question.

A. I'm not speaking specific to the contractual obligations. What I'm basing mine on is the test plan report and then Dr. Penon's final report.

Q. Did anyone from Industrial Heat or counsel inform you that they had never objected to Penon's test plan?

MR. LOMAX: Objection to the form of the question.

A. I believe I've heard that, yes.

Q. Okay.

A. In fact -- well, even last week during -- you questioned Dr. Penon quite extensively on that.

Q. Did anyone ever tell you why they had not objected?

MR. LOMAX: Objection to the form of the question.

A. No, that, I'm not privy to that, no, sir.

Q. How long did it take you to evaluate the

Penon test plan?
A. I don't recall.
Q. An hour?
A. I just said I don't recall.
Q. Can you tell me roughly, was it more than ten hours?
A. Less than ten hours.
Q. Less than ten hours.
Had you been asked prior to this litigation to review the test plan, could you have done so?
A. Oh, sure. Yes. Yes.
Q. And you -- it's your belief that you would have looked at the same plan and said this isn't sufficient, something has to change?
A. More than likely, yes.
Q. Did you review the Lugano test reports? Do you know what I'm talking about there?
A. I looked at them. I did not study them in depth.
Q. Okay. Are you aware that a test was performed in Lugano by a number of Swedish and/or Italian professors?
A. I'm vaguely aware, yes.
Q. Okay. Are you opining at all as to the validity of the Lugano test reports?

A. No. The Lugano test did not -- it did not play into my opinions, sir.
Q. Okay. Are you aware of what test plan was used in Lugano?
A. No.
Q. What about the validation test that was performed as part of this, as part of the parties' contract?
MR. LOMAX: Objection to the form of the question.
Q. Are you familiar with what I'm talking about?
A. Now, are you talking -- are you Lugano or back to U.S.?
Q. I'm asking about a validation test. Are you aware that a test was performed in -- in Italy, in Ferrara, Italy called the validation test?
A. I am aware, yes, sir.
Q. Okay. Did you review the test protocol used for that test?
A. I'm not sure I reviewed it prior to my report. I know I reviewed it afterward.
Q. Are you --
A. I'm pretty sure.
Q. Are you opining as to the sufficiency of that test?

A. If it is -- if it's substantially similar to the U.S. test, my opinion will be pretty much the same.
Q. Do you know if it is or isn't?
A. I'll have to look and study it line by line. I haven't dug into that. I haven't drilled down into it that deeply.
Q. You don't plan on testifying, do you, sir, that the validation test performed in Ferrara, Italy was improper, do you?
A. Again, I haven't -- I've looked at it. I've not studied it in depth. I can't answer your question right now.
Q. Okay. But sitting here today, that's not an opinion that you've formed?
A. Not right now, no.
Q. Now, in your report, specifically the third report on page 10, you state that you have not -- that you have seen no documentation of the machine itself, is that correct, regarding the E-Cat?
A. Correct.
Q. Have you seen any as of this date?
A. Other than the -- you know, I mentioned that picture I saw on the Internet that I couldn't find. And, again, I'm -- I'm talking the machine proper, not necessarily Dr. Penon's report. So with that caveat,

no, I have not seen documentation of the machine itself.

Q. Okay. So are you opining as to the operation of the machine itself, or just simply Dr. Penon's report?

A. Both.

Q. Even though you've seen no test plan of the machine -- or, I'm sorry, no documentation of the machine?

A. Correct, because I'm a boiler expert, I understand boilers. The machine in question is a boiler, so I can make -- and I understand thermodynamics, so, yes, I can opine.

Q. As to whether the E-Cat works?

MR. LOMAX: Objection to the form of the question.

A. Could you be more specific on "works"?

Q. Are you opining as to whether the E-Cat is capable of generating 1 megawatt worth of power?

A. I am opining on that, yes, sir.

Q. Even though you have not seen any documentation on the machine itself?

A. The documentation on the machine may be fraudulent. The other information I've seen and the analysis I've done leads me to believe that it does not work.

Q. Okay. Let me ask you, you said it may be fraudulent.

What facts or evidence have you been shown to that effect or what do you base that opinion on?

A. In looking at some of the data and so forth, it looks very, very suspicious, the fact that I've been -- I'm asked to opine on a heat exchanger that there's -- I've seen nothing on.

In actuality, in looking at a lot of Fabiani's data and looking in some of the things I've seen, it appears a lot of this data were made up.

Q. Okay. We're -- we're going to get to that. But you said you were asked to opinion on a heat exchanger that you've seen nothing on.

Did you request any information on the E-Cat unit from counsel?

A. I believe I did.

Q. Did you receive it?

A. No.

Q. Okay.

A. Now, I take that back. I take that back. I did get some pictures recently -- a picture.

Q. Of?

A. Not the machine itself, but the window on the front of the building.

Q. Okay. And what did that picture show you?

A. Sir, I don't --

\- - -

(Deposition Exhibit 10 marked.)

\- - -

Q. Who took this photo, sir? And we're going to mark this, I'm sorry, as Exhibit 10.

Do you have a copy in front of you?

A. I do.

Q. May I borrow it, please?

A. Oh, yeah. I'm sorry. My bad.

Q. I'll mark that as Exhibit 10.

Who took this photo?

A. I believe Joe Murray.

Q. You believe or you know?

A. Actually, I know, because Mr. Murray gave it to counsel and counsel gave it to me.

Q. How do you know that?

A. I was told that by counsel.

Q. You were told that by counsel.

Do you know who took this screenshot or who superimposed this --

A. I know exactly -- I know exactly who did it.

Q. Who?

A. Me.
Q. Okay. Now, it doesn't state on here who took the photograph.
A. Correct.
Q. Is there a reason --
A. Because anybody could use any camera. Unless somebody puts a name in their camera, somebody else could use it.
Q. Do you know when it was taken?
A. I do. I do.
Q. How do you know when it was taken?
A. Because there's a date taken right up there in the property on the right-hand side of the page.
Q. Other than what's reflected here --
A. That's the metadata off the JPEG.
Q. Now, if I change the date on my camera and I take a photograph, wouldn't it reflect the date that my camera records onto that image?
MR. LOMAX: Objection to the form of the question.
A. Oh, yeah. But this was taken -- I believe it was taken with an iPhone. So if it was taken with an iPhone, it is going to have the date and time that's -- that the cell phone system is producing.
Now, with my stand-alone camera, any little

stand-alone camera, yeah, you can change the date and time. A cell phone camera, that's the date and time that's on the cell phone.

Q. Okay. Looking at this, sir, what does this depict?

A. All right. That is the front of the -- the sign on the door says J.M., and that is the front of the Doral -- I say front, the main street facing side, not the loading dock side, of the Doral test facility.

Q. And how many photographs -- or, I'm sorry, how many windows are there at the J.M. facility?

A. Now, I -- you say "windows." Help me out here. I see -- I see some in the front downstairs, obviously the office area, I see six here, and I believe that's all there are, because there are no windows in the backside of the facility.

Q. Now, looking over directly above that appears to be a Cadillac, you see another set of four windows?

A. To the left?

Q. Yes.

A. Correct.

Q. And do you know if that column is blocking the view of any other additional windows?

A. It may be. I'm not sure.

Q. Do you know if those go to the Doral facility

or not?
A. Help -- can you be more specific?
Q. Do you know if those are windows that are part of the Doral location, specifically the -- the facility used by Leonardo Corporation and J.M.?
A. As it stands now, I'm reasonably certain of that. Again, a site visit will confirm or deny.
Q. Whether -- whether those belong to that facility or not?
A. Correct.
Q. Okay.
A. Assuming we're allowed unfettered access to the facility.
Q. Okay. But you don't know sitting here today?
A. I have -- I'm fairly confident, because when I had looked at the outside the other day, it looked like that was the only set of windows specific to that address.
Q. Did you rely upon this in formulating your opinion?
A. No, I did not, because I just got it recently.
Q. And what have you relied upon this photograph for?
A. Well, this -- you know, again, there was --

Dr. Wong was saying that the heat was discharged through this particular window. And, you know, if it was, in fact, this particular window, it's got some kind of glass or plexiglass -- plexiglass covering on it that would preclude airflow through it.

Q. Now, was the test still ongoing as of February 17, 2016?

A. To my understanding, it had stopped the day before.

Q. Sir, looking at the bottom of page 10, the last paragraph on the page, it states, the Penon reports generally (with some variation) contain certain data. The author understands that these data were provided to Industrial Heat as PDF files and not Excel spreadsheets. The columns are not labeled as in an Excel spreadsheet.

What do you mean by that?

A. Well, an Excel spreadsheet has, you know, A, B, C, D and so forth over to -- as far to the right as it goes, and we call them labels.

Q. Can -- can you convert an Excel spreadsheet to PDF?

A. You can.

Q. Okay. Why would someone do that?

A. If they didn't -- if they wanted to, say,

send it out to somebody and they didn't want the
contents changed, they would convert it to a PDF for
display purposes and then send it off.
Q. Okay. Do you know if that's what was done
here?
A. I do not know.
Q. Okay. So if Mr. Penon did not want anyone
altering his data, he may have sent it in a PDF,
correct?
A. Yes. That would be -- that would be a good
reason to do so.
Q. Okay. So the fact that Dr. Penon sent the
file in a PDF is not indicative as to whether the
results are accurate or not, correct?
MR. LOMAX: Objection to the form of the
question.
Q. There's nothing untoward about sending a
report in PDF, is there, sir?
A. No. No.
Q. Now, in PDFs, can you identify the columns
and see underlying formulas or values that may have
existed?
A. No, not that I'm aware of.
Q. Okay. Looking -- now, sending it in PDF,
that doesn't invalidate the results contained within

the report in and of itself, does it?
A. My report or Penon's?
Q. Penon's.
A. No. The PDF in itself does not validate. Now, just the form- -- let me make it more precise. The PDF format does not inval- -- itself invalidate.
Q. Okay. Did you ever ask for the Excel form of that document?
A. I did. I did.
Q. Who did you ask?
A. Probably Pace. I don't know if I asked Mr. Lomax, because Pace and -- and Bernie for sure.
Q. Do you know if they ever asked Dr. Penon for an Excel form of that?
A. I don't remember. And, again, during the dep last week, Mr. Pace may or may not have asked him for it. I -- I didn't hear that if he did, but the record will show.
Q. Do you know if it was ever asked before you prepared this report?
A. That, I do not know.
Q. Do you know if you asked Mr. Pace for it prior to preparing your report?
A. I did.
Q. And what did he tell you?

A. He said that they've been trying to get it and they've had no luck, I think was a rough paraphrase, but that's pretty much what he said.
Q. And in that portion of your report, did you rely on any special methodology or technique to arrive at your conclusions there?
A. Well, I'm moderately good at data analysis, so I did look at the data as best I could under the limitations of a PDF.
Q. Looking, sir, to the fourth paragraph down that starts with, The column entitled Average Power Supply --
A. Yeah.
Q. -- now, you state that this would appear to be the average power supplied to the E-Cat is watt-hours per hour, which equals watts?
A. Correct.
Q. Some months, watt-hours per hour equals watts, what does that mean?
A. Yeah, watt-hours per hour, if you just -- because you've got watt-hours of the numerator and hours in the denominator, the hours are canceled, making the unit watts. It's just a numerical convention -- or I should say an arithmatic convention.
Q. Okay. You say some months are in watt-hours

and others are in kilowatt hours --
A. Correct.
Q. -- this difference in units is of no concern?
A. Correct.
Q. That doesn't bother you at all?
A. The units proper, no, no. Because kilo- -- kilowatts and watts are -- you know, it's a thousandths difference, so I understand what's going on there.
Q. An interesting thing occurs starting June 2015. If one takes the number in the column entitled Supplied Energy Watts Per Day and divides it by 24, one gets the exact number in the average power supply?
A. Uh-huh, to five --
Q. Why --
A. -- to five-digit precision.
Q. Why is that curious, sir?
A. Because, let's see, did I put -- include that in there? Could I -- if you have a copy of that, I'd like to see it so I can -- if you don't mind.

\- - -

(Deposition Exhibit 11 marked.)

\- - -

Q. Sir, I will show you and mark as Exhibit 11 a copy of the E-Cat MW1 Energy Plant in Miami Energy Multiple Evaluation Final Report.

So since you say starting in June, let's look at July 2015.

A. Okay.

Q. Specifically, why not, we'll choose Independence Day, July 4, 2015.

A. Good day.

Q. Looking at that, sir, why is it curious to you or an interesting thing that if you divide the number that's been given for supplied energy watts per day by 24, that you get that number?

A. If you look at all -- all the numbers in supplied energy are rounded to the nearest thousandth.

Q. Do you know if -- do you know if the equipment used to measure that measured in kilowatts and watts?

A. I don't recall seeing it, so I don't know.

Q. You don't know what equipment was used to measure the energy supplied?

A. No.

Q. Okay. So you're not opining as to whether the equipment was accurate or not with respect to the energy supplied?

A. No.

Q. Okay. So looking at July 4th, it says 200,000 watts per day.

A. Right.
Q. Now, correct me if I'm wrong, but that would be 200 kilowatts per day?
A. You are correct.
Q. Okay. So if we had 200 kilowatts per day or 200,000 watts per day, you divide that by 24, which would give you the average hourly supply, correct?
A. 8333.3 or use a thousandth and move it over three places, yeah.
Q. Why is that curious?
A. It's curious because in looking at a number that's rounded to thousandths, and then over in the column before, you go to five-digits precision, that just strikes me as curious and odd. I would think the numbers, the energy supplied would be more of a random nature. As an example, 200,038, 206,015, just to cite two numbers, in which case, then, dividing that by 24 would come up with a somewhat different number.
I just find it odd to see all these zeros and then divide those by 24 to get that exact number in the column immediately to the left.
Q. Okay. You're not saying dividing the supplied energy by 24 was improper, are you?
A. Well, I just -- if you're looking at, you know, on an hourly basis versus by 24, it's just a math

calculation. Improper or not, it's just a division problem.

Q. Okay. And you were in Mr. Penon's deposition. Did you hear his explanation for the rounded numbers?

A. With -- with all of the goings on with the interpreter and stuff, it -- I didn't have as good a comprehension as I would have liked. Sorry about that.

Q. So -- so if he rounded to the nearest kilowatt, right?

A. If that's --

Q. I'm sorry, that's in yours, but if he rounded up to the next kilowatt --

A. I do kind of remember him saying that, yeah.

Q. -- then that would explain why you have a number such as 200,000, would it not?

A. Yeah, it would.

Q. Okay. Now, you say that it is interesting. That doesn't invalidate his report, does it?

A. Not -- not stand-alone. But it just -- you know, in having analyzed a lot of data over my career, it's usually not this clean and pretty, if you will. When I say "clean and pretty," all these nice zeros. You know, the steam pressure is the same, the output is the same, for the most part.

The data I'm normally seeing is a lot -- what's the word I want? I don't want to say dirtier, but less refined, I guess, might be a better word. Okay.

Q. Do you know whether this test was designed to measure the specifics and for exactness or whether it was designed to determine whether the device, the E-Cat device satisfied the contractual requirements?

MR. LOMAX: Objection to the form of the question.

A. Obviously, you know, I'm not -- I've said I'm not dealing with the contractual issues. But were I doing this test, I would try to be as accurate and specific as I can.

Considering, again, our disagreement aside, if this technology is valid and it works, the potential import for the human race is pretty big. So were I doing it with those kind of stakes riding on it, I would be as precise as I absolutely could and not round stuff. I'd let it -- you know, what it is is what it is and that's what I'd write down in the report.

Q. Is it easy to determine the amount of thermal energy being produced by a power plant?

A. Yeah. I mean, it takes work. You've got to have instrumentation and so forth. When you say

"easy," you know, to my standpoint it's easy, yeah.
Q. And how do you do that?
A. You put in steam flow meters, temperature -- you know, steam pressure, steam temperature. You put in the proper instrumentation for the job.
Q. Well, specifically, steam flow meter you said, steam temperature?
A. Yep. Steam pressure.
Q. What else?
A. That's just a few of them. If -- if I were going to do a test like this, I'd probably use something like the -- did I mention the ASME performance test code as a backbone and then I'd go from there to start modifying my test based on what we have compared to what the -- you know, the code is designed for big steam generating units.
Q. Is that the only way, or is it the best way?
A. It's certainly not the only way, but it's an industry standard way that's pretty well recognized across the country.
And as I mentioned, you know, for something of this potential import, I would want -- I would want the absolute most rigorous test I could use.
Q. And, again, you -- you had been informed that Industrial Heat agreed to the test plan provided by

Mr. Penon?

MR. LOMAX: Objection to the form of the question.

Q. Am I correct that you had been informed of that?

A. I'm sorry, I got crossed up on the objection.

Q. You know what, I'll come back to it.

Specifically, sir, with respect to what you found interesting, the five-digit precision of the average power supply per hour, did you apply any special methodology or technique or otherwise to come to that conclusion?

A. No. And let me clarify, those -- the five-digit precision you just mentioned, that's what -- this is what I would be more likely to see on a test report. And then when you multiply that by 24, it will come out to something.

Now, you know, if Dr. Penon says he did that, multiplied by 24 and then rounded, I'll stand corrected.

But if it was me, again, since we're doing this in Excel, why round? It takes a special round function to do that, which is just an extra step. I'd just let the numbers be what they may. And then when it's all rolled up, maybe then you could, you know, round it up or down then. But for each of these, I'd just leave them, you know, whatever times 24 and call it a day.

Q. But, again, that's -- that's how you would do it, right, sir?

A. Yes. Yeah.

Q. But because it was rounded by Engineer Penon, does that invalidate his test?

MR. LOMAX: Objection to the form of the question.

A. It -- it does not. And that stand-alone does not invalidate it, per se. Again, to me, it just looked curious and I commented on it.

Q. Was there any special methodology, technique or theory that you've applied to come to that conclusion that it was a curious anomaly, if you will?

MR. LOMAX: Objection to the form of the question.

A. Having done a fair amount of data analysis, again, just, you know, what we talked about at length earlier, my procedure is to let the numbers fall where they may.

Q. Okay. So -- and that's what you relied upon in making that --

A. That would -- my methodology was my

experience in data analysis.

Q. Now, looking at the next paragraph that starts with, The column entitled supplied energy, this is apparently the daily energy supplied to the E-Cat. If one takes the values in average power supply column and multiplies by 24, one obtains the almost exact value in the supplied energy watts per day.

Here is the problem: Instead of a value of 24 -- I'm sorry, 247,000, this column on February 6, the author would expect to see a calculation here that would not result in each entry in a rounded number. The report does not explain the calculation or estimation that Penon made to arrive at the reported number.

Additionally, this is inconsistent with the Florida Power & Light records, which cast further doubt on the data in Penon's report.

I'll just start one step at a time. The first part, is that what we've just been discussing, the same issue that you do not believe that Penon should have rounded his numbers for the supplied energy?

A. Correct.

Q. You're not saying that there's a problem with the fact that if you multiply the average power supply watts per hour by 24, that it equals or nearly equals the supplied energy?

A. What it -- what it looks like to me is in looking at these numbers, you know, you've got per day, per hour, you take each of these numbers and call them what, the supplied energy watt-hours per day, that column divided by 24, and you get the exact number in the column just to the left, I find that curious, that's what I'm saying.

Q. Wait. You -- okay. Let's --

A. I stepped on you. I'm sorry. Let me -- my bad.

I would -- I would more expect to see you take a five-digit number here in the average power supply and -- whatever that might be, if you multiply it by 24, then you're going to get a -- you know, a number over here that's not into the thousandths. Now, I understand that Penon rounded them, okay, but --

Q. Hold on. I'm going to interrupt you for a second.

A. Sure. Yes, sir.

Q. So you're saying that they -- that you would have preferred if he took the average power supply, multiplied it by 24?

A. Yeah, that would -- yeah, that would be my preference. And then --

Q. How do you -- how do you come to your average power supply? How do you get that number?

A. I've not been told that, per se. All right. Again, making an assumption on what I know about machinery and so forth is they take whatever metering they were using and when -- you know, at a certain 24-hour clock period, either the data logger will say it used this much or you do a subtraction, time period A minus time period B.

Q. Okay. So you would take the total amount supplied for the day --

A. Uh-huh.

Q. -- and divide it by 24?

A. You could do it that way.

Q. Okay. And so that -- that's actually, in fact, what was done here, right?

MR. LOMAX: Objection to the form of the question.

A. It -- it appears that way, yes.

Q. Okay. And so you would expect that if you've taken the supplied energy watts per day, divide that by 24 to get your average power supply, if you then multiply that average power supply by 24, you should result in the same number as you began with, right?

A. Sure. You're going back and forth doing numbers, yeah.

Q. Precisely. Okay. Now, you state that, additionally, this is inconsistent with the Florida Power & Light records, which cast further doubt on the data in Penon's report.

How is it inconsistent?

A. What I've seen on the records -- and, again, I did not do a huge study on Florida Power & Light. Mr. Murray did, you know, a lot more of an extensive study on that than I did, just I guess I should have maybe referred to his report, but what -- you know, he showed what he considered to be some anomalies between FP&L's data and Mr. Penon's data.

Q. Okay. So the only information that you've reviewed with respect to that opinion that it was inconsistent was FP&L records was the reports prepared by Mr. Murray?

A. Murray, yeah.

Q. Okay. Going down two paragraphs from that to the paragraph starting with -- well, actually, hold on.

Before we leave that last paragraph, you didn't create your own charts or comparison, did you, between the FP&L records and the MG supply recorded by Engineer Penon?

A. No, sir.
Q. Are you aware of Mr. Murray's background, educational background?
A. Somewhat, yeah, I've read some about it. He was a P -- you know, a Ph.D. candidate. I think he was pretty much all but dissertation, I believe.
Q. Okay. Do you know if he was ever involved with Industrial Heat in any manner, or was he an independent expert by himself?
A. Well, he's been both. He was an employee of Industrial Heat, and now I believe he's consulting with them.
Q. Okay. So he's not an independent expert, is he?
A. No. He --
MR. LOMAX: Objection to the form of the question.
Q. From what you understand?
A. Well, he -- well, he was an in-house employee doing an analysis. So from the classic definition of an independent consultant, no.
Q. Do you know what methodology or technique that he used in performing his comparison?
A. I saw all the -- in that one report, I saw the code that he wrote and so forth and I looked at it

and thought, good job, Joe.

Q. You saw the code that he wrote?

A. There was in one of the appendixes -- at the body of his -- and this may be work product because it was labeled --

THE WITNESS: Should I stop?

Q. Well, did you rely upon it in coming to your conclusion that it was inconsistent with Florida Power & Light?

A. I -- I based my comment upon Mr. Murray's concerns with the discrepancy. I'll leave it at that.

Q. Okay. And did you base your comment upon the code that he wrote that you agreed with?

A. I -- I saw the code, I looked at it, and I did not analyze it any further. That would have taken a lot of time to dig into it.

Q. Well, you just said you said, good job, Joe.

A. Well, because it looked like a pretty -- yeah, it was a -- all right, a little bit of a snarky comment, but it looked like a very thorough analysis.

Q. But you didn't analyze it to --

A. I didn't go over it line by line. I did not go --

THE REPORTER: You're talking on top each other.

THE WITNESS: Sorry.

THE REPORTER: Okay. But you didn't --

BY MR. ANNESSER:

Q. But you did not analyze it?

A. I did not go into it line by line, no, sir.

Q. So you don't know if it is accurate or not?

A. Not by my own independent analysis.

Q. Now, sir, looking down to the paragraph I referenced before this, it starts with, The column entitled effective flowed water.

A. Yes.

Q. To begin, it states, The pictures of their flow water meter shows that it reads in meters cubed or cubic meters. This author wonders if the data logger converted cubic meters to kilograms or is done in the spreadsheet -- or is it done in the spreadsheet. Sorry.

What do you mean by that?

A. Well, cubic meters is a volume measurement. Kilograms is a mass measurement. Now, under standard conditions, if I understand the metric system correctly, a kilogram -- a cubic centimeter of water may be a gram.

Again, don't quote me on that because, you know, I know the English system, not the metric system.

But there are some small conversions for temperature and pressure that will -- even though water is incompressible, it will expand and contract a little bit due to heat. So there's a little bit of a correction there. I was just wondering out loud if that -- if that had been done.

Q. And you say, this author has the same concern with respect -- I'm sorry -- in this column as with the column entitled supplied energy watts per day regarding the cell contents seeing the rounded number.

A. Correct.

Q. We've discussed that.

Does the fact that the number was rounded invalidate the report?

MR. LOMAX: Objection to the form of the question.

A. Again, the fact -- that fact by and of itself does not. I just -- it -- I would rather see lots of numbers rather than lots of zeros.

Q. Preferred methodology, that's your preferred methodology?

A. Yes.

Q. So in this paragraph, you're -- you're just expressing the opinion that you don't see why he rounded it, not necessarily that rounding invalidates the final, correct?

MR. LOMAX: Objection to the form of the question.

A. Correct. Yeah, the rounding may have, may not have affected it, it just -- it makes it a little harder. Without -- when you're looking at a PDF like this as opposed to the spreadsheet with the formulas where you can look at each cell and look at the formula, it makes it harder for somebody coming in after the fact to try, okay, what was he doing, what was he thinking here.

Q. Okay. The next paragraph down that begins with, The column entitled reduced flowed water.

A. Right.

Q. And you discuss that Dr. Penon has reduced the flow by 10 percent.

A. Correct.

Q. And your concern, again, is that there's a rounded number in this column?

A. Yes. It's kind of a standing concern on the numbers.

Q. If you take one rounded number and reduce it by 10 percent, it's going to be rounded, right?

A. No. No. Because if I round -- if I take 35,402 and round it up to 36,000 and divide it, it's a different numbers, so that's where you start getting into round-off errors and things like that. So, no, they don't come out clean that way.

Q. If you take a rounded number, sir, say 100,000, and you reduce it by 10 percent --

A. It's 90,000.

Q. -- it's a rounded number?

A. But if you take 103,000 and round it down to 100,000, 90 percent of 103- is a different number, because a rounded number is not the same number as a number. 103,000 and 100,000 are not different -- I'm sorry, are not the same. My bad. So the 90 percent of 103 and 100 are different numbers.

Q. Okay. But you're talking about a rounding of what, 3,000?

A. I'm just pulling a couple numbers out of the air just to illustrate my point.

Q. But, again, it's just that -- it's the same point that you made before, correct, in terms of you would not have rounded?

A. I would not have rounded.

Q. Okay. But the rounding itself does not invalidate the finding, correct?

MR. LOMAX: Objection to the form of the question.

A. Not standing by itself.

MR. ANNESSER: What's your objection, Chris?

MR. LOMAX: Invalidate the findings of what, the entire report? This specific --

MR. ANNESSER: Invalidate the measurements for the findings in his report.

BY MR. ANNESSER:

Q. Did you understand the question?

A. If you would repeat it again for me, I was getting a drink.

Q. The fact that Engineer Penon used rounded numbers, that standing alone does not invalidate the findings of this report?

A. And I believe my --

MR. LOMAX: Objection to the form of the question again.

MR. ANNESSER: That's fine.

MR. LOMAX: Go ahead and answer.

A. Again, and I'll restate, standing by itself, it does not invalidate the report. But it does not give me a warm, fuzzy feeling about what his methodology may have been.

Q. Okay. Did you apply any specific methodology, theory or technique to come to that conclusion?

MR. LOMAX: Objection to the form of the question.
A. 40 years of being an engineer and doing lots of data analysis.
Q. Okay. Now, were you aware, sir, that, in fact, Engineer Penon, in his test plan, indicated that he would apply a 10 percent reduction to the water flow calculation?
A. I'm aware of that, yes, he did.
Q. And, in fact, that 10 percent reduction would result in a lower COP, would it not --
MR. LOMAX: Objection to the form of the question.
Q. -- based on the way the test was set up?
MR. LOMAX: Objection to the form of the question.
A. It would result in a lower calculation of the COP, which is not the proper measurement to use for this type of machine.
MR. ANNESSER: What's your objection on this one?
MR. LOMAX: You're asking -- I don't think you've laid a foundation about his way of determining how to calculate the COP for this test.
MR. ANNESSER: Okay.

BY MR. ANNESSER:

Q. So applying -- or calculating the COP, which I understand you don't believe is the proper technique for performing this test, but if COP was going to be used, the 10 percent reduction would result in a lower calculated COP.

A. It would result in a lower calculated number called COP. And I use -- and I use -- let me emphasize called, because, again, I'm just going to throw in kind of a standing caveat, if I may, about my total objection to the use of COP as a proper measuring yardstick or metric, if you will, for this type of a machine.

Q. Did you apply any methodology, technique or theory in coming to your conclusion that -- I'm sorry. No. Let me -- let me back off that for one second. I'm going to come back to that question.

Sir, looking at the first paragraph on page 12, at the end of the paragraph, seeing a number in each cell as opposed to seeing a formula was an issue of concern for you.

A. Where are we? I lost where you were. I'm sorry.

Q. The first paragraph on page 12. This author has the same concern with this column as with the

Supplied Energy column regarding the cell contents, for example, seeing a number in each cell as opposed to seeing a formula.

A. Gotcha. Okay.

Q. Do you know if a formula was used --

MR. LOMAX: Objection to the form of the question.

Q. -- by Dr. Penon?

A. For what?

Q. In populating that -- this column, in populating the Effective Flowed Water column.

A. It would --

Q. Or I'm sorry. I apologize. It's the Reduced Flowed Water column.

A. Okay. If it's -- if he's reduced it by 10 percent, then the -- I would expect to see a formula down -- and, again, this is a PDF, so you can't see formulas. Were it a spreadsheet, I would -- let's go to the very top -- oh, let's go to July 4th. All right. Just -- yeah.

So you take 36 -- in the column -- I wish these were numbered, but let's just go effective versus reduced, reduced, you'd have something -- a statement equals, cell, whatever times .9. That's what I would expect to see in this reduced column.

Q. Do you know if Dr. Penon did that or not?
A. I do not, because I don't have his spreadsheet.
Q. Okay. So you're not saying he did it wrong, you're just saying you don't know?
A. Correct. Yeah. I mean, you know, the numbers between the two of them are -- they appear to match up.
Q. Okay. The next paragraph on page 12 says, The column entitled steam T min -- is that minimum?
A. Yeah, that should have been a sub --
Q. -- is the measured temperature of the fluid leaving the E-Cat (this author has used fluid instead of steam intentionally. This will be discussed later in the report). We'll get to that. But it says, The numbers themselves are unremarkable. What they actually represent is a different matter.
What do they represent, sir?
A. Well, they suppose- -- they're alleged to represent the alleged steam leaving the E-Cat.
Q. Okay. What facts or evidence have you seen that undermines those measurements?
A. All right. I'm glad you asked that question. Again, that is a number, all right. We're looking at a number here. And, again, that would be reported as a

number. And I'm -- again, just for the sake of discussion, let's assume this is the average number for the day so we don't have to, you know, go through all that other about the math and so forth.

But I'm firmly convinced that the -- well, number one, the way I understand and the way I'm firmly convinced the boiler portion of the E-Cat, there was no superheater, so there could be no superheat leaving the steam. Because if the temperature was actually atmospheric, the steam temperature should be 100 degrees.

Q. Okay. Hold on. If the temperature was atmospheric, the steam --

A. If the pressure. Did I say -- my bad. If the pressure was atmospheric, ambient temp- -- ambient pressure, this steam temperature should be 100.

Q. Could not be heated beyond 100?

A. Not without a superheater.

Q. What's the superheater?

A. As I mentioned, it's a separate device that is external to the boiler proper, not necessarily the whole box, but is external that heats the steam above the saturation temperature.

Q. How does it heat the steam above the saturation temp- --

A. Some heat source. Usually it's a separate set of tubes that get radiant or convective heat from the flame.

Q. But you don't know and you haven't seen specifications on how the E-Cat works?

A. I've seen pictures of the exterior of it, and I know enough about boilers to know there's no superheater in the E-Cat, sir.

Q. How do you know that?

A. What did I just -- not being argumentative, what did I just say? I know boilers. I'm a boiler expert.

Q. Is this a boiler, sir?

A. Yeah, it's a boiler.

Q. You haven't seen documents regarding the components of the E-Cat, but you've declared it's a boiler.

What do you base that on?

A. If he's claiming to make steam, it's a boiler, period.

Q. So anything that gets hot enough to evaporate water is a boiler?

A. Say again.

Q. Anything that gets hot enough to evaporate water is a boiler?

A. No. An open pan of water is not a boiler. It boils water; it is not a boiler. A boiler has a closed vessel to generate steam or hot water.

So the E-Cat as a whole is a boiler. The E-Cat module may not be, but the blue boxes that it's sitting in is a boiler.

Q. And do you know if there's a progression of the steam as it leaves the E-Cat so that they're -- so that the steam could be heated on the way out of the E-Cat? Is that a possibility?

A. It's a remote. Based on what I've seen, there's no means to do that.

Q. But, again, you haven't seen any drawings of the inside of the plant, have you?

A. No.

Q. Okay. You haven't seen the inside of the plant?

A. Well, again, what I've seen of the pictures, I've seen of the boiler, there's no superheater.

Q. And that's, again, just something that heats up the steam for -- right?

A. Above the saturation temperature, yes, sir.

Q. Why is it that the E-Cat itself couldn't heat the water above the saturation temperature?

A. It's physically impossible to do so.

Q. Why is that?
A. It's just physically impossible. It can't happen. It's the laws of physics. They're emperical, not theoretical.
Q. How do you explain the temperature measurements that are indicated in Mr. Penon's report of 103 -- 102 to 104 on most occasions in that event?
A. All right. I see numbers on a page. So explanation, there could be heaters near the thermocouples that are buried under the insulation.
Q. I'm sorry, there could be --
A. Heaters, I'm sorry, strip electric heaters. There could be a box between the thermocouple and the computer that allows somebody to bias the signal from the thermocouple to the computer, or the numbers are just made up and stuck on a page.
Q. Or they could be legitimate?
A. No, they cannot.
Q. Based on what? Based on what facts, sir?
A. What I just --
Q. Because you do not believe that there was a way to heat the steam beyond --
A. It's -- no. It's not that I do not believe, I know for a fact there was no superheater on that machine.

Q. How do you know that for a fact?
A. I'm a boiler expert. I do boilers. I've looked at it. I've looked at the photos and the videos. There's no superheater, sir.
Q. How do you know that?
A. Asked and answered.
Q. You're not going to tell me?
A. I just did.
Q. I don't think you did.
A. Well, then, we agree to disagree.
Q. What methodology did you use to come to that conclusion?
A. 40 years of being a power plant engineer, a stationary engineer's license, a couple engineering degrees, P.E. licenses. Other than that, not much.
Q. And you don't know what exists inside of those blue boxes that you refer to?
A. I don't, but actually it's not that relevant to my determination of why this machine is bogus.
Q. Okay. Why -- why is it that there couldn't have been a superheater within those boxes?
A. Because you can't have steam in the box and it's not -- and it's superheated.
Q. Why not?
A. There's no external way to heat it.

Q. How do you know?
A. How do I know?
Q. You said that there could be external --
A. You have to have an external heat source to superheat it.
Q. You said there could be heater strips by the thermocouple.
A. This is on the outside pipe, not inside the -- this is on the outside where the -- where the temperature was measured. I should have been more specific. My bad. I apologize.
Where the thermocouples were inserted to the outlet pipe, there could have been strip heaters around those.
Q. Do you have any evidence whatsoever that there was?
A. I have no evidence that there wasn't.
Q. So you can't draw a conclusion one way or another as to whether that was the case or not?
A. Not right now. And I'm really -- I would really like to see that steam pipe between the Cat box and the black box to take a look at it both inside and outside. So I hope it's there later in the week.
Q. Now -- okay. So I think -- I think you said, and I don't mean to belabor the point, but other than

your 40 years of experience in the field, you didn't apply any other methodology or theory or technique to determine that there was no superheater or that the steam could not achieve levels above a hundred degrees C?

MR. LOMAX: Objection to the form of the question.

MR. ANNESSER: What's the objection?

MR. LOMAX: It's very compound and broad and vague.

BY MR. ANNESSER:

Q. Did you understand the question, sir?

A. Not really.

Q. Okay. Then let me repeat it.

A. Please.

Q. Other than your 40 years' experience, sir, was there any technique that you used to determine that there was no superheater or any other method of allowing the steam to reach the temperature above a hundred degrees C?

A. The laws of thermodynamics and boiler construction.

Q. And what are those laws?

A. Well, again, I think I've mentioned multiple times already, when you have liquid and vapor in the confines of a pressure vessel, the steam and water will both be at saturation temperature. You cannot superheat. It's not possible, sir.

Q. So you can never have -- okay. Well, let me ask you this: Can water in its liquid form, okay, not steam form, but liquid form, ever exceed 100 degrees C at -- at atmospheric pressure?

A. Well, let's assume that atmospheric pressure is sea level; okay? Let's agree to that first, because it's very, very --

Q. We can agree on that.

A. -- very temperature dependent.

Water at that pressure will exist at 100 C. It's saturated water.

Q. And if it's heated beyond that point?

A. It will convert to steam at the same temperature and pressure. It will convert to saturated steam if more heat is added.

Q. Okay. So if more heat is added, it converts to saturated steam?

A. Yes, sir. And let me -- and the reason -- and this gets back to, you were asking me earlier about my generic description of thermodynamics and so forth. And this discussion we're having goes back to the figure on page 8 that looks kind of like a dome with a bunch of lines on it, that is -- what I was trying to do here is give people that are not engineers a graphical depiction of what's going on so that they could actually see on the diagram what's physically happening rather than try to describe all this in words.

Q. Now, sir, specifically with respect to that second paragraph on page 12, you see where it says steam T minimum, right?

A. I do, yes.

Q. Do you have any problem with Dr. Penon's use of the minimum temperature of the steam during the time period?

A. Well, you know, yeah, the use of the word "steam" bothers me because I don't think there was any. But as far as "T min," I can live with that. "Steam," no.

Q. I believe you had testified earlier that with respect to one of the projects you worked on where you were transferring steam I believe across a river --

A. Yeah, OSU.

Q. Yeah, at OSU, you had testified, I believe, if I'm not mistaken, that the steam was 558 degrees Fahrenheit?

A. That sounds about right, yeah.

Q. Okay. How did the steam get that high?

A. We superheated it. We had a separate superheat in the boiler, so we had a boiler and then a separate set of superheater tubes to superheat it.

Q. So if the E-Cat had separate chambers for its heating, could that have accomplished a superheated steam, in your opinion?

A. Not with the construction I saw of the E-Cat, no. Now, if we can get in one and take it apart, then I -- you know, then you may force me to change my testimony. But until I see that, I'm not changing it.

Q. Okay. So until you -- you see the inside, you're not willing to make any assumption whether that could exist or not?

A. Correct. And let me -- let me further amend -- let me amend my statement, if I will, to see it in the condition that it was during the test, not that it necessarily may be now, because there's been a year interval between the test termination and -- about a year interval -- over a year interval, I don't know what's happened. You know, those -- all the things could be changed.

Q. But, again, you never requested any diagrams or drawings of what these units look like?

A. I can't say that I did or did not. I

probably did knowing me, but I can't say with 100 percent certainty.

Q. Don't you think it would have been prudent to -- before formulating that opinion, to know what -- or how the device operated?

A. Well, I may have asked, and if nothing is forthcoming from plaintiffs, then I can ask all I want.

Q. Well, do you know if -- do you know if the defendants or counsel has that information?

MR. LOMAX: Objection to the form of the question.

A. They have not -- I -- I will just -- I will say that I have asked for it, because I know myself well enough when I do this, and the answer was no, we don't have that.

Q. Can you think of any reason why they wouldn't have provided it to you?

A. You would not have provided it to them.

Q. Okay. So sitting here today, if we had provided it to them and they didn't provide it to you, can you think of any reason why that might be?

MR. LOMAX: Objection to the form of the question.

A. Yeah, they -- they either -- they forgot it or they don't want to.

Q. Might be.

Number 9 on my list is steam pressure, which is the third paragraph down on page 12.

A. Uh-huh.

Q. You state, The numbers themselves are unremarkable. What they actually represent is a different matter. Every cell under steam pressure is zero in the entire spreadsheet.

What does that represent, sir?

A. I understand it to be the outlet steam -- again, outlet so-called steam pressure of the E-Cat.

Q. Okay. And you say what it represents is a different matter.

What does it represent?

A. It represents steam, which I don't believe is present.

Q. Okay. So that statement goes directly to your belief that there was no steam present?

A. Correct.

Q. Okay. The next paragraph says, the steam pressure in the steam pressure column is uniformly reported as 0.0 bar. 0.0 bar is 0.0 atmosphere -- atmospheres absolute. And then you go on and say, if the ERV meant 1 atmosphere, the column should have been labeled 1 bar.

So your -- just so I understand, your objection to that particular column is that he did not state 1 bar or that it was atmospheric as supposed to absolute?

A. Correct. Because if it was absolute, obviously we can't have steam. So this is probably just an innocent typo, truth be told.

Q. Okay. Now, you state that -- and so that typo doesn't invalidate the report, does it?

MR. LOMAX: Objection to the form of the question.

A. Standing -- stand alone, no. Now, again, if he meant that it was steam pressure and absolute bar, yeah, that's a big problem.

Q. You were at his deposition.

Did he indicate one way or another?

A. I don't recall. Again, with the -- all the goings-on with the translator, sometimes it was hard to keep focused on what he was saying.

Q. Now, you state here, another very serious data anomaly is the steam temperatures are almost all reported as being over 100 degrees C. The saturation temperature of water at atmospheric pressure is 100 degrees C.

Is that what we just discussed? Is that --

A. Yes, sir, it is.
Q. Okay. There's nothing different there?
A. No.
Q. So your testimony would be the same as what we just discussed with respect to the steam temperature above 100 degrees C?
A. Yeah.
Q. The next paragraph refers to the column entitled Produced Energy.
And the first thing that you note here is that the columns contain cells as opposed to formulas, correct?
A. Yes, numbers as opposed to formulas, correct.
Q. Okay. And, again, you don't know whether Penon, Dr. Penon, used a formula or if he just put in numbers?
A. And, again, I don't know, correct.
Q. Okay. The next paragraph says, The produced energy numbers should have been generated and provided by a calibrated energy measuring device to include steam flow, steam quality, temperature and pressure.
Is there such a thing as a device that includes all those?
A. Not -- I think they're -- they're generally separate devices.

Q. Okay. And temperature was measured in this case, was it not?
A. Allegedly, yes.
Q. And pressure was?
A. Allegedly, yes.
Q. Okay. Now, steam flow and steam quality, let's talk about those for a moment.
Steam quality. If, in fact, the temperatures were -- and I'm asking you to assume because I know you disagree, but if, in fact, that they were at 103.9 or anywhere between 101 and 104; okay?
A. Okay.
Q. Would you agree with me that the steam quality be -- would be 100 percent?
A. If all of your assertions are true, yes, I would agree in that limited context.
Q. Okay. So if there were measurements -- okay. If the temperature measurements were correct, then you would agree that the steam quality is, therefore, already defined? You don't have to do any additional analysis for steam quality where the temperatures are over 101 C?
A. But the whole -- the whole crux of your question relates on the if, and I'm not assenting to that if.

Q. Okay. I understand. You don't -- you don't subscribe to the temperature measurements?

A. Correct.

Q. Now, I understand that. But I'm trying to define where your areas of concern are and whether this is a separate issue of concern or whether this stems from a prior issue.

So right now, you -- specifically, I know you don't agree with the temperature measurements. You believe that those are faulty in some manner. Okay. But assuming that they are correct, there would not be an additional need for a steam quality measurement of any sort; is that correct?

A. I'm going -- I'm going to answer your question a little obliquely. If this were a conventional boiler, conventional steam system putting out steam at 0 pounds gauge and temperatures above 100, I would agree in that context, yes, to quality 100 percent.

Q. Okay.

A. In the current case, no, sir, I do not.

Q. What is the difference between the current case and the -- a traditional boiler?

A. A tradition boiler has a real superheater.

Q. So, again, this -- this is what I was discussing in terms of that goes back to your belief that there was no superheater.

And so if there was a superheater, you would agree with me that that would change your opinion?

A. If there was a superheater, I would be hugely surprised.

Q. So that's what you were referring to, though, in terms of -- for steam quality.

What about steam flow?

A. What about it?

Q. How would you measure steam flow?

A. With a steam flow meter.

Q. And what does the steam flow meter do? How does that work?

A. There are -- there are a whole bunch of them out there.

Q. Sir, the question is what does a steam flow meter do?

A. Yeah, that, I'm going to answer your question with a -- rather than try to describe them verbally, I apologize, I downloaded some information from Spirax-Sarco, who is a client of mine, but they sell -- they were selling stuff long before I was ever around.

They have a nice disposition -- it's in here. There we go -- on types of steam flow. If you'd like that. Unfortunately, I only made one copy of that, but that's available at Spirax's website with no problem.

Q. Would the steam flow meter indicate how much liquid water had been converted to steam?

A. A steam flow, no. It would -- all it would indicate was the amount of steam passing through a given pipe.

Q. When you say "the amount of steam," how is that measured, in what --

A. Well, in -- in this country, it's pounds of steam per hour.

Q. Pounds per hour?

A. Yes, sir.

Q. Okay. Now, steam is water in vapor form, correct?

A. No. Steam is a gas.

Q. And, I'm sorry, in gaseous form? I apologize.

A. You're correct, yeah.

Q. Yes. So the weight of steam is really the weight of the water molecules; is that correct?

A. Well, a pound of steam is a pound of steam, so a pound -- a pound of steam is a pound of water. The same pound of water is the same pound of steam. The difference is in the volume.

Q. Okay. A pound of water converted to steam, in a boiler, you boil a pound of water, it converts to steam?
A. One pound of steam.
Q. One pound of steam?
A. Correct.
Q. The same exact amount, correct?
A. Yes.
Q. So -- and when that steam is cooled, the steam returns back to the liquid state of water, correct?
A. That's correct.
Q. Okay. And in a perfectly closed system with no losses whatsoever, it would be a pound of water again?
A. Correct.
Q. Correct. So -- so a steam flow meter is one way to measure.
Would another way be to determine how much steam was produced, how much water was heated to steam and turned into a gaseous form?
MR. LOMAX: Objection to the form of the question.
A. I don't understand your question.
Q. So, for example, in -- in our 1-pound

scenario, you put 1 pound of water into the boiler and you boil it all, it's turned into a gas, correct?
A. Correct.
Q. There's nothing left in our boiler --
A. Right.
Q. -- right?
So without a steam flow meter, we know, though, that we have created 1 pound of steam?
A. Correct.
Q. Beyond a doubt?
A. Yep.
Q. Okay. So knowing how much water was boiled and turned into a gaseous state tells us how much steam was created, that it created 1 pound of steam?
A. In your hypothetical, yes. In this hypothetical, yeah.
Q. Okay. So similarly, and applying that to the E-Cat, if we knew the amount of water that was boiled by the E-Cat or converted into a gas, we would then know the amount of steam that was created, correct?
A. No, because an input is not an output.
Q. Okay.
A. The test plan indicated measuring the water coming back from across the wall. That's an input to the E-Cat. It is not an output.

Q. Okay.
A. They're different. No matter -- no matter how you try to conflate them, one is a goesouta, the other is a goesinta.
Q. Okay. Let's talk about the goesoutas and the goesintas. If there is a substantial amount of goesinta, water that goes into the plant, and the only means for it to go out of the plant would be as steam, would you agree with me that in order for there not to be a flood, that the same amount coming in would have to go out?
A. In a -- in a perfectly closed loop with absolutely no leaks, it's totally tight, I would agree with that.
In the present case, I do not agree, because, again, we're trying to measure the efficiency of a heat-producing machine and we have to measure the output. Measuring the input won't cut it.
Q. Okay. Why doesn't measuring the input -- again, in our little hypothetical with the 1 pound of water, we were able to measure the 1 pound of water going into the boiler and know that that 1 pound was the amount of steam produced.
So what is the difference in our E-Cat unit that we cannot make that same presumption?

A. There's leaks. There may be blowdown. Okay. Those are the two things that pop immediately into my mind.

Q. What is "blowdown"?

A. Blowdown is water that is drained off of a boiler to reduce the solids in the water.

Q. Where does that water go?

A. To the drain.

Q. Okay. Was there a drain in the Doral facility to your --

A. I would hope there was. I haven't seen it yet, but I would certainly hope there was at least one.

Q. Why?

A. Well, because it's an industrial facility. You've got to have drains.

Q. Okay. And if there wasn't a drain, then --

A. Then it would go on the floor.

Q. Okay. And was there any reports that you know of of water all over the floor?

A. I can't -- you won't be able to pin me down, because I don't remember exactly where, but I've seen -- I've heard reports of fixing leaks. In looking at some of the fittings, I've seen evidence of leakage. Mr. -- I saw a picture that had been provided to counsel of vapor coming out of the E-Cat -- the Cat box, so that vapor could only come from one place.

So -- but, again, to get back to your perfect hypothetical, yeah, I agree with you. All right. But, again, this is -- this is a performance test of an energy-producing machine. There is no reason not to measure the output.

Q. Okay. The -- the volumes of water that we're talking about processing through this plant, we're talking in the neighborhood between 1.2 and 1.6 cubic meters per hour?

A. I'll not argue with that. That sounds -- yeah. Fine. I'll not argue with that.

Q. That's a fair amount of water?

A. It's not -- yeah, it's a chunk.

Q. It's a good chunk.

And that's per hour, correct?

A. I can't say one way or the other, but --

Q. So if there was -- if there was a leak of that amount, even one hour's worth of water, that would be noticeable, would it not?

A. I would -- I would expect so, yeah.

Q. Okay. Did you talk to any of the gentlemen that were in the plant?

A. I've not talked to anybody that worked there, no.

Q. Okay. Did you know that Industrial Heat had a representative on site named Barry West?
A. I did not know that he worked for Industrial Heat. Apparently if he did, then I thought he was working for Mr. Rossi.
Q. Do you know if he reported ever any massive leaks? And I'm talking over a cubic meter in an hour.
A. No, I don't.
Q. Okay. Now, you said there was some loss due to -- to vapor?
A. Leaks in the casing and so forth.
Q. Leaks in the casing. Okay.
And that -- do you know if that's why Engineer Penon calculated a 10 percent reduction off of the recorded waterfall?
A. I recall reading that was part of his rationale.
Q. Okay. Do you have any problem with that?
A. I -- that ration- -- I still have the whole problem -- the whole rationale of calling it input and output.
Now, an attorney -- and, again, this is a shot at both of you, so don't take it personally, but attorneys can call anything anything. I'm an engineer; I can't do that. I cannot call an input an output.

They were not measuring the output. They were measuring the input. And, again, that's another thing. You know, we can wrangle about this as long as you want. I'm not backing off of that. They should have measured the output.

Q. Okay. I'm not asking, though, sir, what -- what they should have done. Okay. What -- what I'm asking in this case -- and I may even come to the point to agree with you that there may have been better ways in which it could have been done, but the question is is whether these results are entirely invalid --

A. Yes.

Q. -- or --

A. I'm sorry, I stepped on you. Again, I apologize.

Q. -- whether they're entirely invalid or if they're off by even 30 percent?

A. They're entirely invalid because the whole methodology of testing a heat-producing machine is to measure the outputs and measure the inputs.

And don't forget, the output from this machine was going across the gray wall into another black box. And Mr. Penon was pretty -- and this I do remember because I did pay pretty close attention at this point, he did not know nor did he care, and I even -- I think he spells it out in his test plan what happened over there.

So they could have been putting water in, they could have been taking water out. We don't know what happened. And so that's my problem with this methodology, is we -- since we don't know what happened over there, we don't know if what's coming back is what was really being sent out.

Q. Well, let me ask you in this matter, again, if more water was coming into the E-Cat on the quantities that we're talking about between, we'll call it 1 and 1.6 cubic meters per hour, if more water was constantly coming in than was going out in the form of steam, then there's only one result, the water is going to come out somewhere, correct, either to a drain, correct --

A. Yeah.

Q. -- or water vapor, although that would be an awful lot?

A. Correct.

Q. Or some other manner, otherwise, it would just continue to build up inside of this box and we'd have a swimming pool, right?

A. Correct.

Q. Okay. So if the water that was coming in was a correct measurement, we know generally that the water going out, in some form or another, must have been equals; otherwise, there would have been an imbalance and we would have been collecting more water than the facility could have handled?

A. Again, I'm not going to assent to your if. All right. Because, again, J.M. Products as opposed to Leonardo may have been draining the water off. I haven't seen the drains. And Penon didn't care. So that's -- the whole methodology is flawed.

Q. Again --

A. It's totally flawed. And so based on it being totally flawed, the test as a whole is -- is invalid, in my view, because we're not looking at a true output. We're looking at an input that is now supposedly correlated to make it an output.

And a lawyer might make an output an input, but an engineer cannot make an output an input.

Q. Okay. Sir, in going back to our hypothetical with our 1 pound of water, okay, if I pour 2 pounds of water into the boiler, assuming that there is no drain or leaks, and the boiler is dry at the end, is it safe to assume that 2 pounds of steam were created?

A. Again, absolutely, very safe assumption. It's a -- that would be a fact.

Q. Okay. Do you have any facts or do you have any information of any other source by which water could have left the E-Cat unit other than as steam?

A. It could have left as water. They could have just circulated water all the time. And that's what I think happened, is they were circulating water.

Q. In the steam pipe?

A. Yes. In the pipe; not the steam pipe, in the pipe.

Q. Okay. First of all, what level was the pipe, this -- I'm going to call it a steam pipe, and I understand --

A. Fine. We'll agree to disagree.

Q. At what level, how high was that?

A. I don't know.

Q. Do you know if it was above head level?

A. Again, I don't know for sure.

Q. Well, you've seen pictures, sir. You saw --

A. It looks -- again, you know, the angles were kind of -- but I would -- hopefully it was designed to be above head level.

Q. Okay. If it was liquid water, how would the water go from an E-Cat unit up to a pipe that is above head level?

A. If it's a closed loop, water is going to circulate by natural convection. Warm water -- everybody says heat rises. All right. Heat is omnidirectional. Warm water is less dense than cool water.

I will -- I will agree that the E-Cat module heated the water in some method. I've got no problem with assenting to that. All right.

So that heated water is going to be less dense than the cooler water coming back to it. So that will set up a natural circulation loop. And that's actually the way boilers work that don't have pumps, is because of that buoyancy difference, will set up an internal circulation flow.

Q. Okay. That can overcome gravity?

A. Yeah. Yeah, because it's a closed loop. What goes up, comes down. It's a closed loop. Now, if it was an open system, it would not go up. But being a closed system, what goes up must come down.

Q. That means it's got to be watertight, literally watertight?

A. Or pretty close to it.

Q. Okay. Now, you mentioned that you saw pictures with vapor being released. That means the system wasn't watertight, was it?

A. At least at the time of the leaks. Now, the leaks may have been fixed so that it did get tightened back up.

Q. Do you know if there were leaks?

A. The evidence I saw indicates there were some.

Q. Okay. So if it was -- if it was not watertight, if this system inside the E-Cat is not watertight -- and we may get a chance to see that here soon when we go to the site -- would there be any other method that you can think of in which water could somehow overcome gravity, absent a pump, to flow through that pipe?

A. Even if -- even if it's not watertight and there's a little bit of a leak, the leak is going to be small in comparison to that large volume of water that you just talked about flowing. So that little leak is not going to allow atmospheric pressure to enter. So it's -- it's still going to be, I'll call it a quasi-closed system for lack of a better term, so you're still going to have a natural convection heat loop in it.

Q. Okay. Well, let's just say -- and what you're saying is that the flow would overcome the amount that could leak, and I understand that.

What if there was a -- what if it wasn't small, I mean, if it was just wide open, an open area of -- like an open holding tank for water to feed into the E-Cats?

A. But that -- that tank is separated by a water -- a bit of a water column to create a water seal to keep atmospheric pressure from coming in.

Q. I'm sorry, say that again, please.

A. That was bad. If there was a tank like that and it was connected to the E-Cat, there would be a static line between the two of them unless that tank was acting and feeding water in through a pump, you know, if there was a make-up water pump, then that water would be coming in under pressure.

And also don't forget that the -- these -- all these little pumps, you've got all these little what, a hundred or so small peristaltic pumps that are pumping water into the E-Cat. They're going to keep it full more so than the leaks.

Q. Okay. Sir, to come back, because I got off track a little bit, and I apologize for that, coming back to your statement that you can't measure the input as opposed to the output --

A. Well, we could have measured the input. Oh, we did -- I'm sorry. My bad. We could have -- we did measure the input. We could have measured the output.

Q. Okay. Is there any specific methodology, technique or theory that you've applied to arrive at your conclusion that the measurement of the water input into the system does not sufficiently allow a measurement of the output of steam?

A. Haven't I kind of answered that question in the last ten minutes or so pretty concisely?

Q. Well, but I'm asking for specific methodologies or theories or --

A. The theories of hydraulics and fluid flow, the methodology being the ASME, the performance -- or the power test code, the industry standard for determining these kind of things.

In the 40 years of engineering, I have never seen a device that's called an input and output or vice versa. An input is an input, an output is an output and you can't measure the output by inferring the input.

Q. If there were -- if there were no way to measure the output, let's say shot out a hole in the side as opposed to into this pipe, the steam, if instead of going through the pipe -- and I know you disagree with the word "steam" -- if there were no measurement or either an inability or a failure to measure the steam flow out of the unit, would you agree that you could look at the amount of water input into the system to try to determine how much steam was generated?

A. I disagree with your premise that there's no way -- way -- sorry -- there's no way to measure the output. I totally disagree with that.

Q. I understand that. But I'm asking you if -- if we could not or just failed to measure the steam outflow --

A. But you could have and you didn't, so it's not that you failed to, you chose not to and did not. And, again, I don't mean you personally. My bad.

Q. I'm going to correct you, sir, and it wasn't even my client, in fact, because the test plan and test protocol were agreed to by both parties.

A. Okay.

Q. Okay. So both parties.

A. Then to be totally objective, on both of them.

Q. And had they contacted -- had they contacted you before the test, would you have been happy to assist them with their test plan?

MR. LOMAX: Objection to the form of the question.

A. Probably, yeah.

Q. Okay. Sir, looking at the second to last

paragraph on page 12, with respect to the column entitled COP, based on the above discussion, these numbers do not appear to have been properly calculated.
A. Uh-huh.
Q. Is that statement solely premised upon your -- the exceptions that you've taken with respect to the measurements that we've discussed previously?
A. Partially. I don't know if I talked about the use of COP as a proper measuring metric, but I disagree with that also.
Q. Okay. We're going to get to that.
But specifically with your statement that these numbers do not appear to have been properly calculated, okay, for COP, how do you measure COP? What is the formula?
A. Well, COP, the formula in a work-absorbing machine such as an air-conditioner or a heat pump, is -- it's like -- it's shown in both of the professors' books, it's Q moved, if you will, divided by work in. The amount of heat -- I should say Q is engineering shorthand for heat. Okay. So when you get in the books, both professors will use the letter capital Q typically. That's our engineering shorthand for heat quantities.
Q. Okay.

A. I imagine Professor Wong has probably already told you that, but if he doesn't, he will.
So COP, coefficient of performance, is technically and correctly defined for a work-absorbing device such as a refrigerator, air-conditioner, heat pump, as the amount of heat moved from point A typically inside a conditioned space to outside a conditioned space. And then that's divided by the amount of work that it takes to move that heat.
Q. What do you mean by a "work-absorbing device"?
A. Your air-conditioner. You've got electric lines going into it. It runs a compressor and some motors. It's absorbing electric power to move heat around.
Q. Okay. And the E-Cat, for example, absorbs electrical input, correct?
A. Yes.
Q. Okay. And puts out thermal energy --
A. Yes.
Q. -- in the form of steam?
A. It puts out thermal energy.
Q. Okay. It puts out thermal energy.
Again, you -- you take exception with the steam. I understand that.

So, in fact, it is a work-consuming process?

A. No. It's an energy conversion device. A boiler is an energy conversion device. So the E-Cat is actually an energy conversion device.

Q. Well, let me -- let me ask you -- hold on for a second -- does the E-Cat convert the electrical energy input into thermal energy, is that what it's doing?

A. Eventually, yeah.

Q. Eventually. Okay. What happens in between?

A. Well, I don't know. That's supposedly Rossi's proprietary mix in the elements and so forth. Okay.

But, again, I believe it's just an electric heater. You know, he may -- obviously he would probably vehemently disagree with me. But regardless of that disagreement, within the confines of Rossi's model, we are bringing electricity in, heat is an output product.

Q. What is the source of that heat?

A. In my -- I think it's just electric resistance.

Q. Do you have any evidence that you've seen to indicate that? What -- what do you base that belief on?

A. Well, there's just no -- there's no other input that I'm aware of.

Now, that does raise an interesting point, because I understand hydrogen may be part of this process and therein another flaw in the test report and the -- in the test plan and test report, because if hydrogen is an input, then that should be measured as an input, the amount of hydrogen. Because hydrogen is a combustible fuel with a fair amount of heat value, that being brought in should be considered in the calculations as an energy input.

Q. And when you say "heat value," are you talking about calories?

A. Yes, well, calories, BTUs. Again, you know, same stuff, different way of measuring it.

Q. Okay. Do you know what was being used in the E-Cat unit?

A. What I've read is nickel and some other kind of hydride-type stuff. And I've -- and I've seen -- I've also been led to believe that there might be even actually hydrogen gas used.

Q. Okay. And do you believe that those have sufficient calories to -- strike that.

Calories is important to consider in chemical reactions, correct?

A. Yeah. Yes.

Q. Because that's -- that determines how much energy can be released, the number of calories that can be released in that reaction?

A. Correct. How many calories/BTUs, yes, sir.

Q. Is that the same consideration in nuclear energy?

A. I believe it is, because the decay -- regardless of -- again, not being a nuclear engineer, but I do know heat. And the decay of the fuel, elements in the fuel, the nuclear decay produces heat, so there are calories being generated from the atomic interactions as opposed to the molecular interactions in a conventional chemical reaction.

Q. Well, calories are consumable normally without altering the underlying molecules --

A. Well, wait a minute. You say calories are consumable --

Q. Okay. You're correct. Let me rephrase this.

In a chemical reaction, you're not decaying the atoms, correct?

A. Not the nuclei.

Q. Okay. You're not decaying the nuclei?

A. Correct.

Q. Now, in a nuclear reaction, you are decaying the nuclei?

A. Correct.

Q. And, in fact --

A. Or fusing them, decaying them or fusing them.

Q. Okay. And in those reactions, you are altering the nuclei. They are being changed, correct?

A. Yes.

Q. They give off an immense amount of energy --

A. Yes.

Q. -- correct?

Far more than can ever be achieved in a known chemical reaction?

A. Correct. Well, when you say -- let me go -- I mean far more on a unit -- unit mass basis. Let's -- let's quantify it that way. Okay.

Q. Do you know what reaction is occurring in the E-Cat?

A. I believe I've said I do not.

Q. Okay.

A. But I also said that my understanding is that it is a non-nuclear process.

Q. And that's based on Mr. --

A. Stokes.

Q. -- Stokes?

A. And I believe Dr. Ross's assertions, too,

that he said it's a non-nuclear process.
Q. Then what is it; do you know?
A. It's electrical. It's an electrical resistance heater, maybe bringing in some hydrogen, I don't know, but it's probably predominantly an electrical resistance heater.
Q. Now, you -- you had mentioned that you were aware of the Lugano report?
A. I'm aware of it.
Q. Okay. Have you read it?
A. I scanned through it. I did not study it in detail.
Q. Are you aware that a number of Swedish scientists as well as Italian scientists, professors, in fact, performed a test on the E-Cat device?
A. I'm aware of that.
Q. Are you aware that they reported to have achieved a positive CO fee -- COP, coefficient of performance, on those tests?
A. If that's what you say and if that's what's reported, then I'm not -- if that's what they reported, I can't argue with that.
Q. You haven't looked at the report, though?
A. Like I said, I scanned it, I did not study it.

Q. So you had that at your disposal, but you did not consider that before coming to the conclusion that there's no way that the E-Cat could have worked?

A. My reason being is that in the module itself, what goes on is what goes on. All right. The laws of thermodynamics state that for a perpetual -- we discussed a perpetual motion machine, that cannot create energy. Even a nuclear reaction does not create energy. It just changes the highly dense nuclei as opposed to molecular bonds.

Q. Okay.

A. So I'm looking at -- and to me, the whole -- if you're not measuring the output, as far as I'm concerned, the whole test is invalid. And -- and I have -- I have a strong enough belief in the laws of thermodynamics that I absolutely do not believe that any device can produce more energy than it consumes.

Q. Okay. Let me -- let me simplify this. So then, again, your opinion is that the test protocol, the test plan was deficient, not necessarily -- you're not opining that the measurements were -- specifically with respect to the water flow, that the water flow was somehow erroneous?

A. I -- I have questions about the water flow.

Q. Well, there's a difference, would you agree, between having questions and formulating an opinion that it's erroneous?

A. Well, it's -- it is a -- I agree there is a distinction. All right. Number one, it was not the way to measure the performance of the total machine.

Number two, Mr. Murray has done a lot more work into investigating the water meter than I have. He's looked at it, I believe, and so forth and found some discrepancies. So that raises issues as to the validity of the report also.

Q. But you don't have information as to those discrepancies allegedly reported by Mr. Murray?

A. I've looked at some of the issues he raised with Dr. Penon in that one letter.

Q. Did -- did you do any testing of your own? Did you do any investigation as to the water flow?

MR. LOMAX: Objection.

A. Again, how could I? Not physically possible.

Q. How did Mr. Murray?

A. He was there.

Q. He was where?

A. At the Doral site.

Q. Okay. What do you understand his test protocol to have been?

A. Well, he looked at it, and I believe he also purchased some meters, identical meters and tested them.

Q. But you haven't checked his data or his -- his assumptions on those, correct?

A. I've looked at it. I haven't studied it in depth yet.

Q. Okay. Do you know if the -- the angle of the meter was the same?

A. Again, I've looked at it, I've read those issues.

Q. Well, my question is, do you plan on opining as to the accuracy of the water flow meter?

A. I may. I'll reserve that right.

Q. Based on what?

A. I have not yet.

Q. Okay.

A. But based -- based on the rust water line that I saw in the rotor, that raises some major issues for me.

Q. But you haven't opined to that yet?

A. Not yet.

Q. Is there a reason you haven't done so yet?

A. I haven't gotten to it.

Q. But you were retained over a month ago, right?

A. I haven't been allowed access to the site.
Q. Well, you said you saw pictures that -- you saw pictures, I believe, of a rust -- a rust line?
A. Yes.
Q. Okay. Now, sir, have you taken the numbers in Mr. Penon's report and calculated what you believe the efficiency of the E-Cat unit to be?
A. No.
Q. How would you calculate the efficiency of the E-Cat unit if not COP?
A. Through, again, the conventional way. I would use this. "This" being the power -- there again, power test code, performance test code. They changed the terminology. I would use that as a backbone. I would measure the output by an appropriate steam flow meter, output temperature, output pressure, output steam quality. And then I'd measure all the other inputs, return water, make-up water, hydrogen if there is any, electric power input and then do the math.
Q. What's the math? Is there a formula?
A. Inputs -- on -- on the denominator, it's outputs divided by inputs.
Q. That's COP, isn't it?
A. No. You're conflating the issues. COP is the measurement of heat moved by a work-absorbing

device. This is an energy conversion device. They're two separate critters.

Q. What is the difference?

A. I've described it already. Should I do it again?

Q. Okay. Well, besides the difference in the devices, I believe you testified to measure COP, you measure the energy output divided by the energy input, correct?

A. I believe I did, yeah.

Q. Okay. And I believe that's what you just described now for your cal- -- or how you would calculate the efficiency of the E-Cat unit --

A. But --

Q. -- the only difference being how you described the units.

A. No, sir. No. It's not how I describe the unit, it's what they physically are. The E-Cat, for all of our disagreement, is an energy conversion device of some -- some type. The proper way to measure -- should I cut it off and wait till the change?

Q. Go ahead.

A. The proper way to measure is the -- the total output, divide- -- in BTUs or whatever units used, divided by the total input. That is the proper and correct way to measure the efficiency of the E-Cat or any heat conversion device.

Q. Okay. Total output divided by total input?

A. Yeah.

Q. Okay.

MR. ANNESSER: And we will take a break so we can change the tape.

THE VIDEOGRAPHER: We're off the record. The time is 1511.

(Recess taken.)

THE VIDEOGRAPHER: We are on the record. The time is 1521.

BY MR. ANNESSER:

Q. Sir, do you know where the thermocouples were placed in the -- I'm going to call it the steam line. I know you take exception to that -- in the steam line coming out of the E-Cat plant?

A. I think one -- the second one was put in the bottom of the pipe. And, again, I can't tell you the lateral distance from the E-Cat unit. And I believe the other one was put in the top of the pipe or close to it.

Q. Okay. Do you know if that was done at the request of Mr. Darden?

A. I don't know that. Wait a minute. He -- I seem to recall he and Mr. Rossi did have a discussion about that, and he might -- Darden might have had some input to that. I stand corrected, I think.

Q. Now, if one of the thermocouples was at the bottom of the pipe, if water was running over that thermocouple in liquid form, the reading would always be below 100 degrees Celsius, correct?

A. It might be 100, but it would be 100 or below, correct.

Q. So if the reading on that thermocouple exceeds 100 degrees Celsius, that would mean that there was no water running over that line, correct?

A. Or those -- the other -- the other reasons that I mentioned earlier.

Q. I'm sorry, go through them again for me.

A. Sure. Heaters near the thermocouple, a box, an electric/electronic box between the thermocouple and the computer to bias the signal, or, again, the numbers are just totally made up and written down.

Q. Okay. You said a box near the thermocouples?

A. Yeah, electronic box.

Q. How would that --

A. If you put -- and, again, I'm not an electronic tech or a double E, but by taking the output from the thermocouples and then running that through some electronic device with an adjustment on it, you could bias that signal so that regardless of what temperature the thermocouples were actually seeing -- even -- and I will -- I will, because I -- I heard very clearly all your discussion with Penon about the calibration of couples, all right, so, you know, I'll -- I'll not argue that the couples were probably properly calibrated. All right.

Even so, they could have been -- the thermocouples proper could have been properly sensing the temperature, but with an electronic device between their wires and the computer input or whatever other circuitry there was, an electronic device could have been placed to bias that signal.

Q. Okay. And what type of electronic device would that be?

A. Again, I'm not a double E. Most likely some kind of a small resistor.

Q. A small resistor?

A. Again, I'm not a double E, but a double E or an electronic tech could give you a hard-and-fast answer.

Q. Have you seen any facts that would support the conclusion that some type of device was put on this line?

A. I'm giving you reasons why the superheater number could be high with water passing over it.
Q. Okay. But what I'm asking you, not just is there any reason or any way to manipulate, certainly that's -- that's a broad question.
A. Okay.
Q. But what I'm asking you is, have you seen anything in this case to indicate that there was some sort of box put around the thermocouple or the wire for the temperature device -- temperature-reading device?
A. I have not seen anything, per se, yet. But a flow analysis that I have done, as limited as it was, indicates that their -- that these -- the pipes, the size of the pipes could not possibly pass 1 megawatt of thermal -- of steam much less, what was it, 780, 790, 800, whatever that year-long average was, could not physically have happened.
So that further leads me to believe that something was done to adjust that signal to give an improper reading.
Q. Why do you say it could not have happened that the pipes would have passed that much steam?
A. All right. Here we go. I'm looking -- what I have in my hand, this is just a -- the rough of -- partial rough of Mr. Bass' dep.

And when he was talking about the size of the pipes, I have an Excel spreadsheet that I developed a long time ago, because I do, obviously, a lot of steam work. So rather than go through the calculations every time, I just came up with a spreadsheet. And a copy is -- I can make a copy available to you, because it's in the information I provided on these discs, so I have a copy of the spreadsheet, not a PDF, showing you my logic. So what I have -- and if I -- do you want to make this an exhibit?

Q. May I take a look at it?

A. Sure, you may. We may have to go back and forth because that's the only one that I printed.

Q. Can you tell me what this is?

A. Yeah. What -- again, what it is, it's a spreadsheet I developed for various pipe sizes. You input the steam pressure and gauge pressure and then that goes to a lookup table, which is on the second page. That comes back with the properties of steam at that pressure. And then from that look at, up table, the flow of steam through a given size pipe at a given velocity is automatically calculated.

And then what I did -- so that's the right or the three main columns there on the -- I'm sorry, the left as I'm looking at it.

And then the right three columns are the blatant BTU flow. Because as a steam engineer, the steam flow is nice. If I'm sizing the boiler, I may want 50- to 100,000 pounds of steam, but what I'm really looking for is if one of the customers of the steam is, let's just say, brewing beer, all right, they're going to need X number of BTUs per hour in the kettle to brew so many gallons of water to make beer. Okay.

So I'm -- I'm really as much interested in the BTU flow as I am the steam flow.

So see what I did was I converted megawatts to BTUs, and that's a factor of 3,413. And I did the calculations down on the bottom.

So if you look in the left-hand column -- and I normally use 6,000 feet a minute steam flow. That's a good conservative number. Pipes don't get too big to be expensive and there's room for capacity expansion within a given pipe. 12,000 is the upper limit that anybody in the industry really uses. And, again, that's in 12,000 feet per minute of steam flow.

So the two highlighted rows there, those are the numbers that Mr. Bass indicated were probably the size of the output pipe from the E-Cat. So looking at --

Q. Hold on.
A. Sure.
Q. So the first column, NOM Size?
A. That's the nominal pipe size, nominal English pipe size.
Q. Is that in inches?
A. Yes, sir.
Q. Okay. How many -- okay. And what is the schedule?
A. That's -- that's the wall thickness of the pipe. Schedule 40 is standard pipe wall thickness. The higher the schedule number, the thicker the wall, the flow area gets resume- -- reduced.
Q. Do you know the pipe size that was used?
A. No, I don't, that's why I'm relying on Mr. Bass. He recalled it was a 3 or 4 inch.
Q. Okay. What if it was a 6 inch?
A. Then the numbers would flow through -- you know, that would be a 6 inch number then. You know, so you go down to the row number six, if it was a 6 inch, then add those -- again, if it was steam, at those flow rates, that's what the BTU throughput would be. Make sense?
Q. Somewhat, but I -- I need some clarification.
A. Sure. All right.

Q. So looking here at your schedule, and I apologize --
A. Yeah, and I apologize to Mr. Lomax, I only made one copy.

- - -

(Deposition Exhibit 12 marked.)

- - -

Q. Okay. So looking at Exhibit 12, at a 4 inch pipe size --
A. Correct.
MR. LOMAX: Have you said -- have you said what it is on the record?
MR. ANNESSER: Okay.
BY MR. ANNESSER:
Q. And Exhibit Number 12 is a -- Pipe Steam Carrying Capacity that has been put together by the witness.
Now, what formulas underlie these calculations?
A. It's the -- it's called the continuity equation. And the -- the engineering use for that is the mass flow equals the density times the velocity times the flow, or M dot equals row VA.
Q. Okay. Do you make any assumptions in this table?

A. No.

Q. Okay. So there could be no disagreement as to these numbers?

A. No.

Q. So looking sort of at these numbers, on a nominal size pipe, 4 inches, right --

A. Right. Okay.

Q. -- we follow that over with a presumptive schedule 40, what is this next number?

A. That's the nominal flow area in square inches, the idea of internal -- the internal diameter of the pipe, the flow area at that ID for a schedule 40 pipe.

Q. Okay. So the -- that's the circumference?

A. The internal, it's the internal. You've got the OD, the outer diameter of the pipe, the internal diameter and then the -- the wall thickness.

Q. Okay. So looking at the next column, you've got LMB per hour. What is that?

A. Pounds mass per hour.

Q. Pounds mass per hour at 6,000. What is 6,000?

A. Feet per minute. That's the steam flow velocity.

Q. Okay. How do you determine the steam flow

velocity?
A. Through the formula I just told you about, M dot equals row VA.
Q. Okay.
A. And then you take -- you just do simple algebra to back the velocity out. Velocity equals whatever.
Q. So why do you have three different numbers if --
A. Because just -- it was just a convenience for me. Again, I do a lot of steam work, so just to indicate what the velocity might be at -- or, I'm sorry, what the flow might be at a given velocity.
Q. Okay. So let -- let's just, for the sake of going through this, look at the middle section on this section --
A. Sure.
Q. -- which is LBM per hour at 9,000.
A. 9,000 feet per minute, correct.
Q. Okay. And there is a number directly across from the 4 for the size of the pipe?
A. Correct.
Q. Which is 1,781?
A. That is it.
Q. What does that represent?

A. That's the pounds of steam per hour that will pass through that pipe under those conditions.

Q. Okay. The pounds of steam per hour?

A. Yes. And this add -- the other thing that you didn't point out, but I will, is what I've got up in the To block under Steam Pressure, PSIG, that is a drop-down table or drop-down box, so I've inputted, if I may, on the back here, I've just picked some arb- -- not arbitrary, but commonly used numbers of PSIG, convert them to PSIA. Then I've got the specific volume and the latent heat. Then this is what I use in the lookup table to do the calculations. These are the steam --

We were talking earlier about the numbers from Keenan and Keyes. That's where these numbers come from, is from Keenan and Keyes.

Q. Okay.

A. All right.

Q. Now, going back to this. So, again, looking at our number of 1,781 pounds per hour -- and that increases if the pipe size gets larger, correct?

A. Sure. Absolutely.

Q. In fact, if we go to a 6 inch pipe, it goes at 9,000 LBM per hour, you actually go to 4,044 pounds, correct?

A. Yeah, that looks right. Yeah.

Q. Okay.

A. Yeah, that's it.

Q. Now, the 6,000, 9,000 and 12,000 in the steam flow section, those are numbers that you've selected as being more in terms of the commonplace?

A. Those are indus- -- kind of industry standard numbers.

Q. Okay. But you don't have any information regarding what the actual steam flow rate was at the E-Cat plant?

A. That's the whole point. That's the whole point of this drill, sir, is looking at -- the E-Cat is represented to put out a megawatt of thermal heat. Okay.

Q. Okay.

A. So if you go gown to the bottom to the calculation there, if you multiply a megawatt by 3,413, which is the conversion number, you'll come up with whatever that two -- whatever that million number is. All right. So that's the number of BTUs in a megawatt of steam at zero PSIG.

So then we get over to the BTU flow column, the latent BTU, and you can see that there's a pretty big disparity between what the pipe will pass and the

BTUs in a megawatt thermal.
Q. We're going to come back to that in just a moment.
Sir, in -- in your report, the next section refers to test instrumentation.
A. What page are we on?
Q. Page 13.
A. Okay. All righty.
Q. Does -- the first question I have for you is, does the ASME have a standard procedure for testing energy-producing units similar to the E-Cat?
A. Energy conversion units.
Q. Okay. And --
A. A boiler is the energy conversion unit.
Q. Okay. And the E-Cat, which purports to produce energy, more like a power plant?
A. No. A power plant is an energy conversion. A power plant converts the chemical energy in coal or natural gas or whatever into electricity. So it's converting energy from one form into another form.
Q. Okay. And the E-Cat purportedly does the same?
A. Yeah.
Q. It's converting the energy stored in the -- we'll call it the catalyst as well as the electrical

energy into thermal energy or steam?

A. Well, I'll disagree with the first part of your question. You know, the second half, the electrical, I agree with. The catalyst part I disagree with, because the catalyst -- I don't believe the catalyst really -- even if it does enter in -- into the reaction, it's still not going to create more energy than was input to it.

Q. So in a nuclear power plant, energy comes in as we discussed in the form of electrical energy, for example, to run the plant and the equipment?

A. No. That comes from the generators themselves. That's plant internal power.

Q. With respect to the E-Cat, if it were, in fact, a low energy nuclear reaction, you follow so far?

A. Okay.

Q. Okay. Then it would give off additional energy than the electrical energy put in, correct?

A. If it were, but it's not.

Q. According to Mr. Stokes?

A. And Mr. Rossi.

Q. Do you know what type of reaction Mr. Rossi claimed it was?

A. Initially, I believe, he claimed it was an LENR. But I think over time, that story changed. And now I think he's saying it's something like nickel catalyst with hydrogen or some kind of hydrides.

Well, a catalyst -- again, I'm not a chemist or a chemical engineer, but what a catalyst does is a catalyst enhances a reaction. It does not typically enter into it.

Q. So it's your position and your belief today that the only energy coming out of the E-Cat plant was the energy that was put in -- the electrical energy put in from FP&L?

A. Minus losses.

Q. Minus losses.

Now, I think, sir, I think I'd asked you before, I just want to follow back, other than the picture that you saw where there was water vapor, as you described it, in the E-Cat, you were aware that Mr. Stokes stated that there was a steam leak?

A. I think, yeah, he did say that as I recall.

Q. And you don't believe that statement that it was steam?

A. Well, he called it a steam leak. You know, what he -- you know, he may have just used the generic vernacular to describe a steam leak. Instead of being a hot water leak, it's vapor. You know, I think that's more probable, he was using the generic vernacular

instead of being technically rigorous and -- and picky.
Q. Have you talked to him about that?
A. Never talked to him.
Q. Have you called him?
A. Never met the man.
Q. Don't you think it would be prudent to give him a call before making an assumption as to what his statements mean or don't mean?
MR. LOMAX: Objection to the form of the question.
A. I hadn't really considered that, but that's probably going to be on my to-do list now.
Q. Okay. So looking at page 14, third paragraph, now, again, this section is entitled Test Instrumentation, although it discusses the boiler and I don't know that it necessarily addresses the instruments used other than in the broad sense.
Is it your opinion that any of the instrumentation used by Engineer Penon was somehow defective or flawed?
A. Maybe not defective or flawed, but what I -- again, I've not delved into this deeply, but I believe the pressure transmitter was only good to 40, 50, 60 degrees C, and --
Q. And who told you that?

A. I believe it was Joe Murray.
Q. But you have no knowledge. You didn't look that up yourself, did you?
A. I did not independently confirm that, no.
Q. Okay.
A. And then the whole -- all the issues with the water meter itself, you know, the sizing of it, the slope and inclination and all those other issues related to the water meter, I have not delved into those in any depth yet.
Q. Okay. So you are not formulating at this time any opinion as to those matters?
A. Correct, at this time, but I do reserve the right to do so later on if need be.
Q. So am I correct in saying that your -- your report states that you would have done things differently, you would have had a steam flow meter?
A. Yes.
Q. You would have had temperature gauges?
A. Well, we do have temperature gauges, so I'll agree with that.
Q. Okay. We do have those.
You would have had a manometer, is that --
A. Well, but a manometer is just another term for a pressure gauge. A manometer measures low

pressure. But some means for pressure measurement, yes.

Q. Okay. And -- and we had that?

A. Correct, we did.

Q. What else would you have had?

A. A steam quality meter.

Q. Okay. What -- and a steam quality meter. And, again, we agreed that if, in fact, the temperatures being reported were accurate, that there could be no question as to the steam quality?

A. True. But, again, for an invention of this magnitude, I would have spent a couple thousand -- whatever it costs, a couple thousand bucks extra and put in a steam quality meter and -- just to remove all doubt.

Q. Do you know if Industrial Heat ever asked to put in a steam quality meter?

A. I do not know.

Q. Was there anything else other than --

A. Then I would -- again, that's on the output.

The input, temperature -- again, I would measure all the appropriate temperatures and pressures on the inputs and the outputs. And then on the electric side, voltage, ampering phase -- amperage phasing, you know, all of the relevant data that I would think would need to be collected.

Again, to get kind of cutesy, all the goesintas and all the goesoutas with the proper instrument for the conditions at that particular service.

Q. And what were those conditions and instruments at that particular service?

A. Well, again, have -- not having been there, you know, we've talked about the steam flow, the return, whatever it might have been. Some kind of appropriate flow meter, temperature, pressure. Same thing for the make-up water, if there was any blowdown. Typically you don't measure blowdown. Typically it's just considered a little bit of percentage.

And then on the electricity coming in, the voltage on each leg, the phasing -- well, voltage on each leg, the phasing. Let's see, voltage, phasing. I'd check the power factor.

Q. But you haven't formulated any opinions as of this time on those matters, have you?

A. No. And then there's a couple more I'm trying to think of, but -- there's probably a couple more, but those -- those are the big ones right there.

Oh, and any hydrogen coming in. And -- and also the weight. I would weigh -- take the weight of the modules at the beginning of the test, the weight of the modules at the end of the test.

Q. Those are all things you'd put into a test plan or a --

A. Yeah.

Q. Okay.

A. You know, and it's kind of interesting because I found that there was a whole lot of -- just a phenomenal amount of precision in the measurements that were made, which kind of -- wow, that's pretty cool. You're going out to four decimal places to measure these -- these -- these parameters they were measuring. I thought that was pretty interesting.

Q. Okay. And what do you base that on?

A. The data from Fabiani and -- mostly from Fabiani and also from Mr. Rossi.

Q. Now, have you plugged that data into the COP calculation that was performed by Mr. Penon to see if -- if that greatly alters the COP?

A. No. What I -- what I did is I looked at it just from a data integrity standpoint. A few decimal places out when you're talking hundreds and ten thousands and ten thousands, our difference is deciding on the COP. As far as doing the calculation goes, that's not going to affect it to any significant effect.

Q. Okay. So in that case, if you rounded then, it would not necessarily have any large impact --

A. Yeah, it would be -- it would be an impact on the number, but it would be pretty small.

Q. Di minimis is the word.

A. Thank you.

Q. Okay. Now, sir, looking at page 14, the second to last paragraph within the section before we get to E-Cat Heat Rejection --

A. Wait. Help me out here. Where are we at?

Q. The second to last above E-Cat Heat Rejection.

A. Oh, okay. Okay. I gotcha. I'm sorry.

Q. The paragraph that starts with, Mr. Joe Murray addressed some of his concerns to the ERV --

A. Yes.

Q. -- do you know what the ERV's responses were?

A. I -- I have not seen those.

Q. Did Mr. Murray tell you?

A. No, he did not. I think his -- to the best of my recollection, I'm not sure he did get a response. "He" being Mr. Murray.

Q. Okay. And then you list a number of things. This author shares -- also shares the other concerns

Mr. Murray has about other issues in his letter, to wit: 2, the consistency of reported flow rate statistics; 3, the number of reactor units in operation varied substantially over time; 4, system alteration on the night of February 16th or the morning of February 17th; and, 5, the flow of steam through the pipe to J.M. Products. This author reserves the right to address these issues at a later date.

As of this point in time, have you formulated an opinion as to any of those matters?

A. Let's see, steam flow rate statistics, I've not looked at those. I would really like to have Mr. Penon's original spreadsheets.

I'm not -- Mr. Murray has done more with the number of reactor units, so I need to dig into that.

Q. Sir, the -- the question is real specific.

A. Oh, maybe I misunder- --

Q. Sitting here today, have you formulated any opinions as to the matters listed in this paragraph to which you are prepared to testify?

A. Let's see here. Yeah, the flow rate -- the flow rate statistics we've talked about already in great detail so I don't need to opine any more on that.

Number of reactors, not now.

System alteration, not now.

And then the flow of steam through the pipe, we've talked about that. And I should have put "steam" in quotes, so that's a typo on my part. But, yeah, and we've talked about the steam flow, so I've already opined on that.

Q. Okay. Well, with respect to the steam flow, that's not included within this report, is it?

A. No, it's not. And I did -- again, I did that -- I did not know what the diameters of the pipe were. When I found -- when I read Mr. Bass's dep and I saw that, I thought, this is something I need to look at, so that's when I did it.

Q. So that was done after the fact?

A. After the report, yes, sir.

Q. And have you done a subsequent report to add that in?

A. Not yet.

Q. Sir, the next section is entitled he-Cat -- I'm sorry, E-Cat Heat Rejection. And to do this, you do a number of calculations here.

And I think -- or am I correct in saying that those are predicated upon this chart that you've provided me?

A. They're somewhat similar. If you look at 79 times 3,413 -- and I hope my numbers come out exactly the same -- so, yeah, this was predicated on the average over the what, year, 15-month testing period, whatever the number of days was. That's why I used the 790 and then the 1 megawatt down at the very bottom, just to give the two numbers for a comparison.

Q. Okay. Let me ask you a question. The number 3,413 BTU hours divided by kilowatts, where -- where do you get that number?

A. That -- that's a standard conversion from metric to English, English to metric.

Q. BTUs to --

A. BTUs per hour per kilowatt.

Q. And, sir, looking at the next page, page 15 of your report --

A. Yes.

Q. -- the first real paragraph, other than your calculations, it says, an 80 boiler horsepower boiler is a small commercial boiler. For illustration, below is a generic picture of a very common Cleaver-Brooks steam boiler of this type.

That's not what exists at the E-Cat plant, is it?

A. I couldn't hear your last part.

Q. That's not what's at the Doral facility?

A. Oh, no, no. This was -- this was put in just merely for comparison to compare the E-Cat to conventional technology of the same output, not necessarily the same physical size --

Q. Okay. Is that --

A. -- or configuration.

Q. Is that 80 boiler horsepower (BoHP) boiler capable of putting out the amount of -- well, capable of putting out -- I believe you used 790 kilowatt -- kilowatts per hour?

A. Yeah. If you -- if you look at the top of page 15, that's what those two -- those calculations were, just a cross-check. And I converted kilowatts to BTUs and then BTUs to boiler horsepower.

Q. Okay.

A. And then -- and then the second calculation, I did it just straight, I looked it up off another conversion just to do a cross-check, because I always try to cross-check my work, and they came up pretty close.

Q. Okay. So you state here that it does not appear to be greatly different in size than the E-Cat.

What does that tell you?

A. Just -- I'm just talking phys- -- you know -- you know, its output, thermal output -- alleged thermal output would be the same. And then the physical size, it's roughly the same again, you know --

Q. How long is that boiler?

A. Oh -- and, again, this may not be an 80 horsepower boiler. This is a Cleaver-Brooks picture. All right. So if you look at the man, yeah, probably 12 feet long.

Q. 12 feet long and --

A. Ish.

Q. -- what about height?

A. Well, it looks like about 8 feet, again, depending on the guy. Total, probably 8 foot-ish.

Q. Were you aware that the E-Cat is contained in a 40-foot container?

A. I was.

Q. Okay. And you said this is 12 foot long. We're talking about --

A. This is just to give a comparison of the -- of the size of an 80 horsepower boiler to compare it to the size of an E-Cat.

Q. You would agree that it is greatly different in size than the E-Cat, wouldn't you?

A. Not greatly different; it is somewhat different.

Q. In fact, the 40-foot container is more than twice and almost three times -- actually three times as

long?
A. Okay. Fine.
Q. Did that have any effect on your report, sir?
A. Well, just, again, I was doing this for, you know, comparison's sake, not as an exact numerical, here's apples, here's oranges.
And when I say greatly different in size, you know, if you would say, now, if we compare it to this building, yeah, it's greatly different. But the whole E-Cat is several modules and that are, you know, different size kind of stacked together. So if you look at the volume and so forth, yeah, they're different. The E-Cat is bigger, I will -- you know, there's no question about that, but they're not hugely different is what I'm saying.
Q. Okay. So -- so this boiler, which is approximately a third of the size, is capable of putting out the same amount of energy that the E-Cat is purported to have put out?
A. Yes, that's correct.
Q. Now, you then, in the paragraph below that, go in and you ask a -- what appears to be a rhetorical question, what happens to this heat --
A. Correct.
Q. -- the amount of heat that's being put out by

the boiler or by the unit, Doral.

And you go on to describe that in a commercial operation, that the heat would be used and the product stream would then have to be cooled for further processing and packaging and shipping, et cetera, basically stating that all of the heat that entered the product stream would leave the product stream either by air cooling or by some sort of heat exchanger?

A. Correct. There may -- and I should have probably added a little bit of water cooling depending on the process, but that doesn't change the overall concept of what I'm trying to say. The heat has to go somewhere.

Q. In reference to make --

A. Did you change pages?

Q. Yeah. Go on to page 16. You state, to illustrate, if one boils water (212 degrees Fahrenheit) to make sweet tea.

Now, when you make sweet tea, sir, do you turn it into steam, or does it allow -- do you allow it to remain in the liquid form?

A. I don't make sweet tea, and I did that because we'd be -- we're going to play to a southern audience, so -- no. But you get the water right where it boils and when it's -- even before it starts to boil, you've seen people put a pan of water on the stove, at maybe what, 195, 200-ish, it's going to start to vapor because the vapor pressure is going up. You know, it's not really steaming, it's vaporing.

So, no, once the water starts to boil, then you put it in the tea. Because once it's 212, it's not going to get any hotter than that at sea level. That's as hot as it's going to get.

Q. Okay. So you can't really compare that necessarily to steam that you refer to in the paragraph before?

MR. LOMAX: Objection to the form of the question.

A. I'm not following your question.

Q. Well, you state in the paragraph before, all the heat that entered the product stream would have to leave the product stream --

A. Yep.

Q. -- either by air cooling or some sort of heat exchanger?

A. Yep.

Q. You go in to illustrate -- and you're talking about hot water as opposed to steam?

A. Right. But the same concept applies. The heat has to go somewhere. The steam or the hot water are hotter than the surroundings. And, again, if we go back to your -- the coffee analogy, you get some 180 degree, $2 million McDonald's coffee and you sit it in a room, over time that coffee is going to cool to room temperature. The heat has to go somewhere.

Q. Okay. Now, you say in the second paragraph on page 16, In an industrial process, the product cooling is accelerated by the use of heat exchangers or fans or other mechanical means of cooling.

And I believe you go down from there, excuse me, and you say, in the issue at hand, let us first assume that air is used to cool the product stream. Please keep in mind that 2,700,000 BTUs enter the product stream every hour of every day in the test. You go on to say, the same 2,700,000 BTUs per hour then leaves the product stream and has to be rejected to the environment?

A. Correct.

Q. Okay. Now, the next paragraph, you refer to the simulation videos performed by Engineer Murray?

A. Uh-huh, I did.

Q. And you don't know what presumptions were put into those calculations or simulations?

A. That's correct. I've testified to that

already.
Q. Do you know the size of the Doral facility?
A. I do not, not -- not with any specificity yet.
Q. Okay. And you don't -- and you didn't do your own calculations or projections?
A. Not like Mr. Murray did in this regard, no.
Q. Did you do any others?
A. For airflow?
Q. Well, for --
A. Or for heat simulations? No, I have not done a heat simulation similar to what he did.
Q. Do you know what assumptions Mr. Murray made, such as were there any vents?
A. I -- I believe he did show some vents, but, again, how he sized them or so forth, the specifics I do not know at this time.
Q. And would those specifics affect your opinion as to the ability of the environment to reject that heat or to dissipate that heat that was generated by the plant?
A. To a small degree, yes.
Q. To a small degree. Why is that?
A. Well, because the heat is being generated at such a high rate that it's going to take a lot of air

movement to get rid of it.

Q. And so if, let's say, there were large bay doors at the back of the facility that were left open, would that allow heat to escape?

A. It would allow some escape, because, again, hot air rises. Okay. So that air is going -- you know, the heat is going to be generated and that air is going to be continuously heated, it's going to tend to rise, and then some of it will start to spill back down.

So I don't know if Mr. Murray did a simulation with doors open or doors closed, but that might be a very productive thing to look at.

Q. Okay. Now, the heat rising could go up to vents in the ceiling, correct?

A. It could, yes.

Q. Okay. Do you know -- do you know how many vents there are in the ceiling?

A. No, I don't. The pictures I took when I was outside last week looked like there was one power ventilation fan, and then the other might have just been an area that it might have been a skylight. I couldn't tell from a distance.

Q. So you don't know, you're speculating?

A. Well, one is -- one is definitely a vent fan.

Okay. I know that for a fact. Whether it was running or not, I don't know.

The other, I'm just going to have to say I don't know for sure right now.

Q. How much -- how much heat could be removed by that vent fan?

A. Not knowing the size of it, I can't answer that now.

Q. Okay. Do you know if Mr. Murray assumed that that was a vent fan in operation?

A. That, I don't know.

Q. How much heat could be removed by opening the doors in the rear of the plant?

A. Again, that, I can't -- I can't give you a hard answer.

Q. Okay. How many vents or windows were there at the facility?

A. I don't think there were any windows at the back on the loading dock side. There was a door, there was a man door. I believe there were three -- three bays. And then on the front, I did see -- off of what I'm assuming is the office area, there was a door and the typical glass skylight or lights around it.

And then the windows above it we discussed from Mr. Murray. I -- I want to say there were six windows, there may have been four. Those are the ones that I'm aware of. And, again, having -- we'll have to look at the internal configuration of the building before I can give you a hard number.

Q. Okay. Now, you go on to describe, after going through Mr. Murray's reports, which he did not verify, you go on to say that, JMP could have used a roof-mounted fan to remove all the rejected heat.

Do you know if that was done or not?

A. I -- I didn't -- I have -- I've seen no evidence of it to date. From what I've seen, I don't see any evidence of it.

Q. And what you've seen -- well, turning to page 17, these are just examples of roof-mounted ventilation units?

A. The top one is. The bottom one is a standard cooling tower.

Q. Okay. Now, turning the page to -- and do you know if either one of these were present?

A. I know a cooling tower was not present.

Q. How do you know that?

A. I didn't see it. I looked at airflow. I looked at the facility, and I looked at air photos from Google and Bing, and saw nothing anywhere in the area that even resembled a cooling tower.

Q. Let's talk about those photos.
Those are the photos that are contained on page 18?
A. That is correct, yes, sir.
Q. When were those photographs taken?
A. That, I don't know.
Q. Could they have been taken in 2012?
A. They could have been, sure.
Q. Okay. Could an overhead unit have been added since that time?
A. It's possible.
Q. Okay. Could a water tower have been added since that time?
A. A cooling tower, depending on the roof loading and so forth, it's possible to install a cooling tower, yes.
Q. Okay. What about a roof-mounted ventilation unit?
A. Same answer, yes, it's possible.
Q. And you don't know whether that happened or not?
A. Not at this time, no.
Q. Okay. Similarly, a heat exchanger could have been installed within the unit; is that correct?
A. Now, you're going -- please be more specific

with me, because I'm still -- you know, when you say -- and, again, I'm not trying to be difficult here, but I want to know to which heat exchanger you're referring.

Q. Okay. The heat exchanger that we referenced before on the mezzanine --

A. Okay.

Q. -- and you now have a description of, correct?

A. Well, I have what was represented to Dr. Wong as being the heat exchanger.

Q. Okay. If that existed, how much heat could that have removed?

A. Well, you know, with a huge if, in all caps, were true, I would say Dr. Wong's calculations are probably reasonable.

But unless he knew the exact configuration and how the pipes were arranged and how the airflow was, you know, all the -- all of that goes into that calculation. So he's -- he's operating as much in the blind as I am.

Q. Okay. So if we were to assume, okay, that the information provided to Dr. Wong that he has reflected in his report were correct, you would agree with me, wouldn't you, sir, that the amount of heat being produced by the E-Cat unit, or purportedly being produced by the E-Cat unit, could have been dissipated through that heat exchanger?

A. How -- well, again, with the huge if, I will give you a qualified yes.

But here's the question I have: How did the heat get from the serpentine -- again, I shouldn't be asking you questions, but it's a rhetorical. I don't understand how the heat got from the serpentine exchanger in the black box to the alleged heat exchanger in the mezzanine. Nobody has explained that to me yet.

Q. Have you asked?

A. I've asked these fellows and Mr. Murray and they don't know.

Q. Okay. Do you know if they've asked anyone?

A. That, I don't know.

Q. Did you write an email to Mr. Barry West and ask?

A. I have no idea where he is.

Q. What about Mr. Penon?

A. I -- no. No. I make it a practice not to talk to people on the other side of the issue, as you can understand.

Q. Is Mr. Penon on the other side of the issue?

A. He's a defendant.

Q. Is he?
A. I believe he's -- isn't he a named defendant in the countersuit?
Q. He's not a defendant in this case as it stands now. He was originally named.
A. Then I guess I'm at a bit of a loss. Wait a minute. Here. Here it is on the -- yeah, he's -- in this countersuit, Fabio Penon.
Q. What are you looking at, sir?
A. Exhibit Number 7, the front cover page.
Q. Do you know whether he's been dismissed from this suit?
A. That, I don't know.
Q. So before you went down to Mr. Penon's deposition, did you ask counsel whether he was still a party to the suit?
A. No. It didn't seem like -- no, I did not.
Q. Did you ask him any questions other than the questions that were asked during the course of the deposition?
A. I'm not a lawyer. I couldn't legally ask him questions, I don't believe.
Q. Could you have walked up to him and said, hey, how are you doing today?
MR. LOMAX: Objection to the form of the

question.
A. I think we exchanged a little pleasantries at the end, but that was it.
Q. Did you ask him if he wouldn't mind if you asked him questions?
A. No, I did not ask him.
Q. Now, sir, looking at --
A. And, again, at the time, I was -- let me -- let me clarify a little. At the time, I was presuming that he was still an adverse party, so ethically I cannot talk to him or ask him questions if he's an adverse party.
Q. Who told you that you cannot talk to him?
A. That's been my understanding all along. And even if I can, I don't, because he's an adverse party and I just -- I make it a practice not to do so.
Q. Okay. The -- looking at page 20, is it fair to say that the first two paragraphs are just simply your description of what you see in that photograph?
A. It is.
Q. Okay. Then in the third paragraph starting, Is there anyplace else in the facility, then you go on and you perform a calculation to determine whether there could have been -- or city water could have been used to reject that amount of heat energy, correct?

A. Correct.

Q. And based on the calculation that you performed assuming the 50 degree inlet water temperature and 130 degree water outlet temperature.

Now, you say sewer temperature restriction. Where did you get that information?

A. A lot of places use 130 degrees, well, as a sewer temperature restriction, number one, because a lot of sewer pipes are now made out of plastic, and if you put really hot water down them, they don't like it. It will destroy them or damage them. And then a lot of times, waste treatment plants, the bugs like a certain temperature, so --

And then Miami-Dade may be different. But most of the jurisdictions that I'm familiar with have some kind of a sewer water temperature restriction to protect their facilities and protect their -- their biological processes in the waste treatment plant.

Q. Is it your opinion, sir, with respect to the water flow meter that was used on the E-Cat, that additional water was being supplied from the J.M. side?

A. I'm -- I'm raising that as a possibility. I'm not stating it for an absolute fact because, again, our side of the litigation has not been allowed in there yet.

Q. Where -- where would that water have come from?
A. The city.
Q. Okay. But you checked the -- the water usage for that facility and it averaged 4.6 gallons per hour?
A. That's -- yeah, that's what the numbers tend to indicate.
Q. Okay. Would 4.6 gallons per hour of water flow be sufficient to result -- wait. Is that between 1 and 1.6 cubic meters of water?
A. I'd -- I'd have to do the calculation. I can't answer that right now.
Q. Okay. So you don't --
A. It's a pretty simple calculation, but I can't answer it right now.
Q. You don't know whether 4.6 gallons of water is equivalent to 1 cubic meter of water?
A. I forget the conversion factor right now.
But, again, that -- to me, that's a trivial issue. It's a math calculation.
Q. Okay. So you go on and you do that calculation with respect to a fluid cooling system, a water cooling system, correct?
A. Correct. Some kind of a heat exchanger, yeah.

Q. And based on the fact that there were only 4.5 gallons per hour used, you came to the conclusion that there was not enough water usage from city water to have cooled that amount of heat --
A. Correct.
Q. -- is that correct?
A. Yes, sir.
Q. Okay. So you've determined that city water was not used for that heat rejection?
A. Correct.
Q. Now, you then go down and say, where did the rejected heat go? Air cooling, no.
What did you base that conclusion on?
A. My analysis of the airflow -- a lot on Mr. Murray's -- not my analysis, Mr. Murray's analysis --
Q. Okay.
A. -- on -- on what happened, how the building would heat up, if that amount of heat will continually reject it into the facility.
Q. Okay. But you don't know what presumptions were made and what -- what available avenues for that heat energy were, such as the number of vents, their operational ability or whether there was a heat exchanger up on the mezzanine, as you described it, of

the facility?

A. Well, we've discussed that. Again, I'm not --

Q. I just want to be very specific here.

With respect to your conclusion that it was not done by air cooling, that was predicated upon Mr. Murray's analysis?

A. Primarily, yes.

Q. Okay. The cooling tower, no.

Is that predicated upon your observation of those two aerial photographs?

A. Of the two air photos. And then, again, in looking at the picture of the facility, go back up a page to look at the -- the photograph on page 20 of Exhibit 7, I don't see any kind of industrial equipment, I don't see -- I see there might be a couple of pipes on -- on the backs -- on that back wall where they're going up. Those could be for an air-conditioner, those could be roof drains, but I don't see any kind of serious piping, racks, anything that would indicate an industrial endeavor inside of that enclosure.

Q. What all -- what would you expect to see --

A. Well, let me -- I'm sorry. Let me finish. I'm sorry.

So I don't -- you know, to go up to a cooling tower and back, you're probably -- again, without doing a design calculation right now, probably looking at 6-, maybe 8-inch pipe going up and coming back.

Q. How large is that pipe on the back wall in that photograph?

A. I don't know. There's no scale.

Q. So you don't know, it could be a 6-inch pipe.

A. It could very well be.

Q. It could be an 8-inch pipe?

A. Possibly.

Q. So you don't know, you're speculating?

MR. LOMAX: Objection to the form of the question.

A. It's a speculation -- and speculation may be the wrong word -- based on 40 years of working in and around real industrial facilities.

Q. Do you know what they were producing at J.M.?

A. Nothing, I don't think.

Q. And what do you base that conclusion on, sir?

A. The evidence I've seen.

Q. What evidence have you seen?

A. There's no -- well, again, I see no evidence of an industrial facility here in the picture that we discussed.

Q. What is lacking from that photograph that tells you that there was no production whatsoever?
A. May I read to you? I've written it in the report. The second paragraph below the picture, The last interior. All right.
And then the second, Other than the small items along the left wall, there are no visible pipes, pipe racks, pipe drops, conduits, cable trays, transformers, switchgears and so on and so on with which one would normally associate even a small manufacturing facility.
And that's not exact, but I shortened it a little.
Q. Now, those pipe drops, conduits, pipe racks, visible pipes, cable trays, that would vary depending on what you're producing, isn't --
A. Oh, yeah, no argument.
Q. So what were they allegedly producing there?
MR. LOMAX: Objection to the form of the question.
A. I've heard various things. I've heard cooking platinum sponge, I've heard graphing. That's really all I've heard.
Q. Okay. But --
A. Let me finish the question. I'm sorry.

But I've seen no invoices sent out for products sold to customers. I've seen no receipts for incoming materials. I've seen no construction documents that show how the facility was constructed. So there's nothing that leads me to believe they were, in fact, producing anything.

Q. Okay. Your -- your evaluation with respect to that, is there any specific methodology, technique or theory that you apply to come to that conclusion, or is that just your observation?

MR. LOMAX: Objection to the form of the question.

Q. Is that just your observation or the facts?

A. It's real-world observation based on 40 years of industrial experience, plus all the other stuff --

Q. Is it your belief that a layperson would not be able to come to that conclusion on their own?

A. A layperson that works in a factory that understands factory would come to that conclusion, pretty much the same conclusion.

Yeah, they could have a small machine shop in there making widgets that wouldn't need heat with what they got there, that could -- that could happen.

Q. Okay.

A. But for anything that's a massive steam user,

I see no evidence of that occurring in this photograph.
Q. How do you -- how do you cook platinum sponge, sir?
A. Well, that's an interesting question. I'm glad you asked that question, you know, because I had that same question myself and --
Q. Are you an expert on cooking platinum sponge, sir? I've got limited time, so I'm going to try to find --
A. No, wait a minute. No, I'm going to answer your question. You asked me a question --
Q. Well, then, I'm going to strike the question because I'm not going to waste my time while you look through documents.
A. All right. I'll be brief then without the document.
The engineer, the product engineer that I sent an email to at one of the platinum facilities said he had never heard of cooking platinum sponge.
Q. What facility, sir?
A. That's why I'm looking for the piece of paper so I can give you the company.
Q. You know what, I don't even need it, it's hearsay.
So, sir, going back to your report, now,

you're not an expert on cooking platinum sponge or --
A. If it exists, even if it -- if cooking platinum sponge is, in fact, a legitimate industrial process.
Q. Sir, it sounds to me like you'd rather play the role of a jury member as opposed to an expert.
A. No, but I like --
MR. LOMAX: Objection.
Q. You seem to be opining to areas outside of your area of expertise.
A. You asked me a question. I --
MR. LOMAX: Hold on. Hold on. Wait for a question. I haven't heard a question. Until there's a question, you don't need to say anything.
THE WITNESS: Sorry, gentlemen.
MR. LOMAX: Is there a question?
BY MR. ANNESSER:
Q. Sir, coming to page 21 of your report, you state, There are now but two alternatives. And, again, we've already established that the air cooling was predicated upon Mr. Murray's findings in his study.
So absent that, that the heat just vanished, and I don't think anyone has claimed that in this case --
A. Okay. We agree on something.

Q. -- that it never existed.
A. That's my contention.
Q. Okay. If there was a heat exchanger there in place, sir, and I know you have not seen evidence of it, but if, in fact, there was a heat exchanger as described in Dr. Wong's report, could that not have also been a source by which the heat could have been removed?
A. Until I know how the heat got from the serpentine exchanger in the black box to the heat exchanger -- the alleged heat exchanger in the mezz, I cannot -- I cannot give you an objective engineering answer to that question, because the heat has to move from point A to point B to point C. Nobody has told me the intermediate step.
Q. Okay.
A. So you --
Q. So your answer is I don't know?
A. No. My answer is you have posited no means for me to get -- for me -- for anybody to get the heat from the serpentine coil to the mezz. If you had -- don't have a means, it didn't happen.
Q. Okay. If there's a -- let me give you an example. If there's a fan in there that pushes the steam along, would that --

A. A fan to push steam, are you serious?
Q. Well, okay, how would you move steam, sir?
A. At that pressure, you can't.
Q. You can't move steam?
A. You're going to have to have a pretty cold surface to create the pressure differential to move zero psi steam at those velocities through that size pipe. It's not going to happen.
Q. At what velocities, sir?
A. Any of them. Any that are listed in that chart in Exhibit 12, it's not happening.
Q. And what methodology, technique or theory do you use to come to that conclusion?
MR. LOMAX: Objection to the form of the question.
A. The same answer as before to multiple questions.
Q. 40 years of experience in the boiler industry?
A. Thank you, sir.
Q. I can give it myself.
A. Holy cow.
Q. Hey, I might be an expert.
Now, sir, you -- so how long did it take for you to do all of your research and compile your report?

A. It was a period -- it was -- the time was -- admittedly, the time was compressed. I want to say probably about five days just going almost flat out. And, again, that's not a hard-and-fast number. I'd have to look at my billing record, you know, my hourly numbers in my book.

Q. So in five days, you did your full analysis of all those documents and generated your report?

A. Of the -- of the information I had at the time, yes.

Q. Did counsel, when they retained you, give you any restrictions as to your assignment?

A. Well, they said to see what you can find out, you know, dig into the information and come to your own analysis.

And, in fact, they were -- on the -- on the initial conference call, they were pretty adamant, because -- about -- because Mr. Murray had written some stuff, they were pretty adamant about not giving me Mr. Murray's analyses so as to taint any conclusions that I would come to. They wanted me to come to the conclusions I came to not totally independent of Murray, because obviously I'm going to rely on his airflow, but pretty much independently of the other things he had concluded.

Q. Yet on day one, actually, in fact, the day before you were retained, you had a copy of his questionnaires.

Well, here's -- here's the issue that I've got, sir, is while you tell me that they wanted you to remain completely independent, on -- as of the 24th of January, I believe the day before you were retained, you had been provided a memory stick with, among other things, Mr. Murray's first queries to Engineer Penon, his spreadsheet summarizing the data from Florida Power & Light prepared by Mr. Murray, Industrial Heat's spreadsheet summarizing the data from Penon's file, the final report prepared by -- or on behalf of Mr. Murray, as well as Mr. Murray's October 31, 2016 power analysis, Mr. Murray's photographs of the Doral location, his videos of heat simulation conducted by Joe Murray, and a video and photo of the flow meter time lapse conducted by Joe Murray.

So on one side they're telling you, we want you to be completely independent from Mr. Murray, and I understand that, but then on another side, they've produced all this information to you the day before you were retained that results from Mr. Murray's work as opposed to your own.

MR. LOMAX: Is -- is there a question?

Q. Is that -- is that correct, sir?
MR. LOMAX: Objection to the form of the question.
Q. How -- how can I justify those two positions?
A. Understood. I did receive -- and it was actually two sticks, not one. But I -- I didn't get to them until a day or two. I might have stuck them on my hard drive, but I didn't do anything with them.
And, yeah, they did give me that information. He was looking at the meter and the -- but they didn't -- what I kind of assumed where he had done similar -- a similar expert report, so maybe it was just a miscommunication.
But even so, I have not looked a lot at his Florida Power & Light comparison. I looked at it, but I didn't study it. And his flow simulation, again, I looked at it, so I was relying -- because of the absence of evidence or documentation from plaintiffs, I had to rely on that.
So I -- and I don't know if there was other information that he had produced that is subject to their privilege in their attempt to keep me as independent as we can.
So, yeah, I did rely on some of his information, but you've probably already figured out,

I'm a pretty hard-headed guy, I make my own conclusions.

Oh, and I did find that email, in case you're interested. The fellow's name on the platinum sponge is Gabriel Leis. He's a product engineer with American Elements. So if you would like a copy of this, I will be more than happy to give it to you.

Q. Well, we're -- we're going to go through some of the stuff you brought with you today.

But before we do, did you do anything to prepare for your deposition today?

A. I did.

Q. What did you do?

A. Obviously, talked to counsel, you know, work product-type discussions. And then I've just done more research, subject to the report, obviously our discussions haven't stopped, my analysis hasn't stopped, so I've been looking at more -- more issues as I -- and, again, as my understanding comes up -- because this is a complicated case, I think we can all agree to that. You know, at least from my standpoint, this is not a simple case. So, you know, as my understanding is maturing, I'm looking at more things. And I'm not saying my understanding was immature at the beginning, it's just, you know, I'm -- it's filling out.

Q. Okay. Now, sir, you had mentioned previously, and I -- it just came back to me, that you had seen an expert report from Mr. Murray?

A. No, not an expert report. They -- I did not see that and they did not provide me one, and I don't know if there is one.

Q. Did you review any report of Mr. Murray's?

A. Well, before, his analysis. Now, is that a report or analysis? Semantics. Okay. His airflow simulation, a report, analysis? Again, we can quibble words. But I did not see a report similar to a typical expert report that one normally sees in litigation.

Q. Well, sir, I'd like to take a look at the documents you've brought with you today other than the ones that we've already marked --

A. Sure.

Q. -- to see if there's anything that I'd like to ask you about.

A. Certainly. All right. How do you want to do this? There's a lot of stuff here. Now, the stuff on the floor, I think we've dealt with it all. Do you want to go through it and make sure?

Q. If I can.

A. Yeah. Absolutely. Let's make sure we're not -- there's enough paper flying around anyway.

MR. ANNESSER: Chris, do you mind if we go off the record just to take a look real quick and that way we're not shuffling papers in front of the camera?

MR. LOMAX: No problem.

THE VIDEOGRAPHER: We're off the record. The time is 1626.

(Recess taken.)

THE VIDEOGRAPHER: We are on the record. The time is 1652.

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(Deposition Exhibit 13 marked.)

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BY MR. ANNESSER:

Q. Sir, during the break, we looked at some of the documents that you brought with you today. And I'm going to mark one in particular as Exhibit 13 and ask you to identify that document for me.

A. Yes, sir. What this is, it's -- the top page is April of 2015. And then the other pages are various iterations. Or I'm sorry. The next page is -- I think it's from Mr. Fulviani's power readings and then with his annotations in Italian on the far right-hand column.

And then the rest of the document is June of

2015. And these are -- I believe I took these off of what were Rossi -- I think it was Rossi -- 0075 or whatever the document was. But basically, I just took his data verbatim and looked at it. And then I did some data sorts on it and some data analysis looking at various parameters.

Q. Okay. So to take that data, did you input that data directly into an Excel spreadsheet?

A. What I did -- no. What I did to avoid data corruption is something like for Mr. Rossi, I will open it up or even save it as, I'll just open it up, and then I will save it as. In this case, it's like Rossi date and then underscore RES working. That way I can play with it and then, you know, the other one goes back, I don't touch it. And I say "play," but, you know, do my thing on the data. And if I screw up the spreadsheet, it's not -- I'm not messing up the data that I had to work with.

So that -- that's the way I normally work, that -- you know, I have a working copy, and then the original I don't touch. I just open it, save it under another name, put it away.

Q. Okay. So this data was provided to you in Excel format?

A. Yes, sir.

Q. And what you've done is just simply manipulated the data pursuant to searches?

A. Correct, doing data sorts and, yeah, various statistical manipulations.

Q. Okay. And for what purpose did you do that?

A. Well, the reason -- what kind of piqued my curiosity was -- actually was during Mr. Penon's dep last week when Mr. Pace was questioning him, oh, probably about the -- halfway through the time he had allotted, and Pace was asking some questions about some power outages and things in the mid-June time frame. And at the time, I didn't pay a whole lot of mind to it. I was kind of, you know, more interested in listening.

And then my subconscious kept processing it and I thought, hey, let's take a look at this stuff, because, you know, Pace was interested in questioning off of it, let's see why.

So I started looking at it and just -- I guess what really piqued my interest is -- and I'll just use -- and, oh, the first sheet, this is April of 2005. Again, the time -- and date and time columns are self-explanatory. I didn't -- I use those in the block to keep everything, but they're self-explanatory, so --

And I've got a note up here just to show what the column headings are. T out, I'm assuming that's temperature out, pressure out, and then temperature in. My assumption is this is the T out from E-Cat, this is the outgoing pressure, and then this is the return water pressure.

Q. May I see that first, please?

A. Certainly.

Q. Now, with respect to the P out in this document, which you believe was the pressure out?

A. I believe that's what it was, yeah.

Q. Okay. Those numbers don't say zero, do they?

A. No, they don't. And I think -- I think I conceded that it might have been a typo, an innocent typo in Dr. Penon's report. Again, it doesn't change my opinion in the report, but I'm willing to admit, that was probably just a minor oversight on his part.

Q. Okay. So looking at this, sir, it appears to you that pressure was measured?

A. There are numbers on the sheet, yes, but I'm not going to concede the pressure was measured. I will concede that there's numbers on the sheet.

Q. Now, you received that in an Excel format?

A. Yes.

Q. Did you check whether there's any sort of formula or anything in this sheet?

A. That --

Q. Any formula for a calculation of anything or were these just numbers?

A. These are just numbers. As far as I could tell on these sheets here, they're just strictly numbers.

Q. All right. So the underlying data, and understandably in his report he puts 0.0 and we've marked that report --

MR. ANNESSER: This is your copy or is it --

MR. LOMAX: This is mine.

Q. -- we've marked that report as an exhibit in this case. But in the report, it reflects a pressure of zero. But this appears that there were calcu- -- or, I'm sorry, not calculations, but measurements of pressure taken that varied from 0.0?

A. That is correct. There are numbers that are different than 0.0.

Q. Do you dispute any of the numbers on that sheet, sir?

A. Well, subject to the discussions we've had, yes, I do, okay, about as far as temperature goes.

Pressure, I'm not going to argue with too much about temperature and probably much -- T out, yeah, I'm going to -- you know, we'll go to the mat on

that one.
Q. Okay. That's -- and, again, the T out is predicated upon your belief that there could not have been that amount of temperature because there wasn't a superheater for this tank?
A. Well, that's part of it. That's one of several issues that I've identified that I think are the cause for the number.
Q. Could you summarize for me, because it's getting late in the day and I've --
A. Understood.
Q. -- I've perhaps forgotten some of the issues?
A. Sure. Heaters near the thermocouples, strip heaters, little electric-type heaters.
Q. Do you know if those existed or not? That's a possibility.
A. It's a possibility. I'm not saying for an absolute fact they exist, but I also am saying there's a -- there's a potential they may have been there.
Q. Okay. And there's a potential they may not have been there?
A. True, but I haven't seen it, so I'm still -- I'm raising that as an issue to investigate.
Q. Okay.
A. Some kind of an electrical box between the

thermocouple proper and the computer to bias the signal.

Q. Okay. Similarly, you haven't seen this box, it may or may not have been there, you have no information --

A. The same answer as before, yes, sir, I'm not sure. And then, again, the data is just being made up, the temp- -- I should say the temperature numbers just being made up.

Q. That's a possibility, but you haven't seen anything that indicates --

A. There was no way I would know that because I was not there when they were doing the test. So right now there's no -- but I'm still -- I'm saying it is a potential possibility to explain the anomalies I'm seeing.

Q. Okay. Okay. May I see that document that we --

A. Sure.

Q. -- had just marked as Exhibit 13?

A. Yeah. You need the whole thing, or just --

Q. The whole thing. I want to keep that together.

A. Do you want an explanation of anything else on it, or was that it?

Q. No, sir.
A. Okay.
Q. Not at this time.
Sir, have you had the opportunity to review Dr. Wong's report in this matter?
A. I have.
MR. ANNESSER: Okay. Let's go off the record for just a moment.
THE VIDEOGRAPHER: We're off the record. The time is 1700.
(Recess taken.)
THE VIDEOGRAPHER: We are on the record. The time is 1703.
- - -
(Deposition Exhibit 14 marked.)
- - -
BY MR. ANNESSER:
Q. Sir, one of the documents you brought with you today is a document Thermodynamics for Engineers, Second Edition, by Kaufui Vincent Wong, which I've marked as Exhibit 14.
And, sir, you brought that document with you today?
A. I did.
Q. Okay. Is there anything within this

publication that you disagree with?
A. Well, are you talking the whole book, or just what I've --
Q. Well, what you've brought with you.
A. No. What I've brought with me, no.
Q. Anything in the rest of the book that you didn't bring with you that you disagree with?
A. No. Actually, and you can tell Dr. Wong I said so, I think it's a pretty good book. It's readable. You know, it looks like he's very rigorous in his analyses, but it's readable. I like that, so you can tell him I said so.
Q. Perhaps for an engineer. Some of us --
A. Okay. Fine. Be that way.
Q. All right. And I believe you said you had reviewed his report --
A. Yes, I have.
Q. -- in this case?
And do you take exception with any of his findings?
A. His calculations, I have no argument with his calculations as far as they go. But where I think his -- where his report was deficient is not getting independent confirmation of the facts that were represented to him.

Q. Did you obtain any independent confirmation that those facts that you're referring to were incorrect?

A. I've been trying to and I haven't got them yet.

Q. Okay. And what have you done?

A. Well, again, you know, the issues with the heat exchanger, we've already talked about that, and COP, so I think we have discussed those at some length.

Q. So -- so you would agree, sir, that if the factual predicate upon which Mr. Wong prepared his report were correct, and I know that's an if for you, but if they were correct, then you take no exception with -- and so it's Professor Dr. Wong's findings?

A. Do you have a copy? Could I take a real quick scan of it just to make -- I don't want to say something that I don't really intend here. And I'll be -- I'll be a real quick scan of it.

\- - -

(Deposition Exhibit 15 marked.)

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Q. Okay. And I'll show you a copy which we'll mark as Exhibit 15. Watch yourself on the staple.

A. All right. Thank you.

Okay. I've done a quick scan through just to refresh my memory. Obviously I disagree with him on all the major points. Okay.

As far as his calculations go, you know, if, again, huge if, the information was -- presented to him was correct, then his calculations would be reasonably correct, yeah.

Q. So you said you disagree with him on all the major points. But if the information upon which he was provided is correct, then you would agree with his findings?

A. I would -- I would agree with his calculations. Again, I disagree with him on COP. And the one thing where he does talk about -- he's on the inverse power relationship, this is on the top of page -- the top of page 3, the inverse power relationship, that's part of what Mr. Murray looked at, so I'm -- I'm going to withhold the comment on that section.

But as far as using COP, I totally disagree with that. And then as -- again, as far as --

Q. And just -- just remind me, you're --

A. Yeah. I'm sorry.

Q. -- what you believe should have been done is to measure the energy output over the energy input into the E-Cat device?

A. Yes. Correct, using a -- that's more

standard efficiency-type calculation because it's a heat conversion device -- or energy conversion device as opposed to a work-absorbing device.

Q. Okay. Now, what about the sustainability of working conditions that -- your opinions on that pertain to Dr. -- I'm sorry, Mr. Murray's conclusions, correct?

A. Where are we at? Help me out here.

Q. Actually, you know what, that was in two section -- page -- bottom of page 5.

A. Let's see here.

Q. That's from Mr. Murray's opinion, not yours, correct?

A. Yeah, I understand. Again, right now, I guess it's more -- more work is going to have to be done either by Mr. Murray or something. Again, since I've not studied the minutia and the details of Murray's simulation, I can't comment on that. So, you know, maybe that's something he and Dr. Wong can duke it out over.

Q. Okay. And then, again, predicated -- you predicated it upon the facts that he relied upon being accurate, if we make that assumption, you don't dispute his finding that the heat exchanger, if -- if constructed the way that it was indicated to him and referred in this report, that that would have been sufficient to remove the amount of heat necessary or the amount of heat that was produced or allegedly produced by the E-Cat plant?

MR. LOMAX: Objection to the form of the question.

Q. Let me restate that because I confused myself. All right.

Taking the assumption that the information provided to Dr. Wong was correct with respect to the heat exchanger that Dr. Ross claims to have existed, if we assume that that information is correct, you take no exception with Dr. Wong's calculations?

A. The calculations, per se. But in your first question, you mentioned the construction of the heat exchanger, and that's a huge issue.

Q. Well, let me -- let me come back to that.

A. Okay. All right.

Q. So the first part, you take no exception with the calculations?

A. As far as the calculations, per se, themselves go, stand alone, they're typ- -- they're nonremarkable engineering calculations.

Q. So if the -- if there was a heat exchanger that was constructed in accordance with the information provided by -- provided to Dr. Wong and reflected in this report?

A. But it -- help me. It's not -- I don't see that the construction is -- you know, I see some details about pipes and so forth, but nothing about the box or how the pipes were arranged as far as rows and staggered and all that that is important. That's pretty critical right there. So I will -- I will respectfully disagree on that issue. I don't -- I know nothing about the construction of said alleged heat exchanger.

Q. Okay. What -- what would change that calculation? You agree that the calculation or the formula used is correct?

A. I -- I -- I appears so. Again, it's been -- it's been a while since I've done air cold heat exchangers, so I'd have to go back and do a little homework of my own. But this is -- this is a very, very standard formula. All right. Yeah, that's -- I've got no argument with that.

But as far as the specifics of the heat exchanger, yeah, we're -- we're definitely at odds on that one.

Q. As to whether those -- whether the information that's provided here was correct or not or whether it exists?

A. Whether it's correct and whether -- more importantly, whether it existed or not, yes.

Q. Okay. But if -- if someone were to find or determine or for all intents and purposes prove that the heat exister -- or heat exchanger, sorry, existed in the same size and specifications as listed in Dr. Wong's report, you would agree that that system would be capable of removing the amount of heat purportedly produced by the E-cat?

A. Not really, because, again, I've got to go back to what I said about moving the heat from the serpentine exchanger in the black box to this alleged heat exchanger. We don't know anything about the flow of the fluid inside the pipe, velocity, Reynolds number, anything like that.

So, yeah, again, we'll go back and forth. I agree with this equation, but I disagree with your general premise, because even so, we need a lot more information than what I think has been provided to Dr. Wong.

Q. So but just sitting here today, and I understand you're saying you need more information, but sitting here today, you're not stating that his findings are incorrect, you're stating that you need additional information to know whether they would be correct or not?

A. I'm saying --

MR. LOMAX: Objection to the form of the question.

Go ahead, you can answer.

THE WITNESS: Okay.

A. I'm -- yeah, I'm saying it's like on COP, I'm saying his findings are incorrect, okay, as far as how to calculate the performance of this device. I totally disagree --

Q. We're talking about a different --

A. Okay. Now, if we're on the heat exchanger -- I thought it was a generic question.

On the heat exchanger, again, I'm going to keep going back to the specificity issue. Okay. And when you say it can be proven, you know, that's --

Q. Let me make this very easy.

Under a certain set of facts, Professor Wong -- Professor Dr. Wong's calculations may be correct, you just don't have enough information that allows you to be comfortable that it is? Is that -- is that your testimony?

MR. LOMAX: Objection to the form of the question.

A. What he's been given is a certain set of assertions, not necessarily third party verifiable facts.

Q. Okay. And if you were to assume those were correct, those assertions were correct --

A. But I won't assume those. I'm sorry, I won't assume those.

Q. But you don't -- you don't know one way or another whether they're correct or not?

A. That is true. That is true.

Q. Okay. Now, have you done any research on Professor Wong?

A. A little bit.

Q. Okay. Have you reviewed his report and his background?

A. I -- yeah. I went through them, yes.

Q. Do you believe he is qualified to opine as to these matters based on your review?

MR. LOMAX: Objection to the form of the question.

A. Again, you know, it's really the court's determination is he qualified or not. But, you know, looking at his CV and so forth, he's got a very, very nice, wonderful academic CD -- CV, I'm sorry. You know, looking at his picture in his book, he looks like a great guy.

But as -- you know, I don't see a whole lot of real world engineering experience here, so, you know, that -- that does cause me a little bit of concern.

You know, as far as doing calculations and stuff of an academic nature, no argument. But as far as real world industrial engineering experience, I don't really see any that's he's pointed out here.

Q. Are there any other flaws that you see in his report that you think are -- that you think are incorrect?

A. Not at this time. You know, again, you'll be the second person to know if I do.

Q. Probably the third, I think.

A. Yeah. Well, that's okay.

Q. There's a couple people at Jones Day.

A. That's what I meant, yeah. Thank you.

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(Deposition Exhibit 16 marked.)

- - -

Q. Sir, just as a wrapping up matter, there's a number of documents that you brought with you today. This is the stack that you brought to me. We're going to mark that as composite Exhibit Number 16. I'll find a way to keep those together here in a minute.

You've also brought with you two CDs, which you've informed me are identical; is that correct?

A. Yes, sir, they are.

\- - -

(Deposition Exhibit 17 marked.)

\- - -

Q. And pursuant to an agreement with counsel, what we will do is we will mark one with an exhibit sticker Number 17. Both Mr. Lomax and I will add our initials to it. I think initials, because if we sign, we might take up all the room, for authentication.

MR. ANNESSER: Do you wish to do the same with yours?

MR. LOMAX: Yes.

MR. ANNESSER: Okay. So we will initial both here. And that way we don't need the court reporter to keep a copy.

THE WITNESS: Chris, did you initial that one? Mr. Annesser, Chris needs to initial that one.

MR. ANNESSER: Oh, yes, sorry.

THE WITNESS: And the marker.

MR. ANNESSER: And unless corrected by counsel, by agreement of counsel in this case, both will be named originals for this deposition.

MR. LOMAX: I'm going to just ask the witness, do you agree that you made copies that are identical? Is the information on those CDs identical?

THE WITNESS: Yes. What I -- again, subject to any computer errors, what I did is I used my burner program to make two copies. So rather than, you know, moving the information twice, I moved it once, said make two copies, and then used two discs for the same data.

And then I -- after I closed the program, I just did a quick spot-check on both of them.

MR. ANNESSER: Okay.

THE WITNESS: So I did a little bit of QC. And I didn't check every file, but I will represent that they are identical to the best of my knowledge.

MR. ANNESSER: Okay. What we will do is the court reporter, when we're all done, will photocopy the front of these discs and maintain that as part of the record, and we will keep -- counsel and I will keep copies of these CDs.

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(Deposition Exhibit 18 marked.)

\- - -

Okay. And next there were the two memory sticks that you referenced earlier that we will mark as

Exhibit 18. And we'll ask the court reporter to take custody of those and return the original to you after copying each of them as quickly as she can.

THE WITNESS: No hurry.

MR. ANNESSER: Okay. Okay. If we can go off the record for just a moment, I think I may be able to wrap up shortly.

THE VIDEOGRAPHER: We're off the record. The time is 1719.

(Recess taken.)

THE VIDEOGRAPHER: We're on the record. The time is 1725.

BY MR. ANNESSER:

Q. Sir, in addition to those opinions that you've set forth on page 21 of your report, you said that there was one additional opinion that you had come to that you plan to testify on.

A. That's correct.

Q. And what was that additional --

A. Could I take a look at that very quickly on the exhibits as a memory jogger?

Q. I'd like if you can find the original exhibits so that --

A. What number --

Q. -- we can have you refer --

A. -- 7?

MR. LOMAX: It's going to be up here.

THE WITNESS: Sorry. Where are we at?

BY MR. ANNESSER:

Q. Let me hand you mine for a moment. Let me represent that that is a copy of Exhibit 7.

A. Yeah, it is. And the additional -- to answer your question, the additional opinion that I'm going to amend to the report is that if there were steam flow, if, again, big if on my part, that there's no way the steam could have transited the pipe due to the pressures and the velocities involved with the -- with the power output and the -- thermal -- excuse me, the thermal outputs that were being claimed.

Q. There's no way that it can transit the pipe?

A. They could, but the pressure drop would be extremely high. And I didn't -- the velocities would have to be just about double that are shown on that one exhibit, the spreadsheet that I made, to try to stuff that many BTUs through pipes of those size.

Q. Okay. And when did you come to that conclusion, sir?

A. That was just over the weekend after -- as a result of the discussions, you know, during Dr. Pen- -- yeah, Penon's dep, and then, you know, just thinking about it, my subconscious said, hey, let's look at this, too.

Q. Okay. Over this past weekend, like yesterday?

A. Yeah, like -- like -- like Saturday, yeah, like this past weekend.

Q. And you haven't supplemented your report or --

A. Not yet, no, sir.

Q. Okay. Did you rely upon any publications in arriving at that conclusion?

A. That's a -- that -- that would be a typical fluid flow, like I gave you the formula. That's just a standard fluid mechanics flow form that you can find in any good fluid mechanics book.

Q. Fluid mechanics or steam?

A. No, fluid mechanics.

Q. Are we talking about fluid flow, or are we talking about steam flow?

A. It works for both of them. Steam is a fluid.

Q. Did you reference any literature in arriving at that opinion?

A. When you say "literature," like books or --

Q. Did you grab a book and flip through it and say --

A. Oh, that -- well, that spreadsheet is based on -- the spreadsheet that I developed is based upon the continuity equation.

Q. What is the continuity equation?

A. I mentioned it's mass -- mass flow equals density of the fluid times the velocity of the fluid times the flow area of the pipe.

And then I also used the steam tables for the properties of the steam for that look-up -- for the look-up table for the various pressures.

Because of steam -- steam -- steam being a gas, as it is compressed to high and higher pressures, the density or the specific volume, as we call it, changes. It squeezes down. Being a gas at zero psi, it may occupy -- and, again, I'm going to kind of do this for the camera -- a rather large volume. As the pressure goes up, the volume -- a pound of steam will occupy a smaller and smaller volume.

Also, as if -- if indeed the steam were superheated, as the steam heats up, it also expands, so that's going to exacerbate the issue.

Q. Is there a reason that you did not include that in your report?

A. I didn't think of it at the time.

Q. Is there any specific methodology that you applied in performing those calculations?

A. I think I just told you.

Q. Well, you said that you -- that it was a basic calculation predicated upon the continuity equation?

A. Yes. That's -- that's a formula and a procedure.

Q. Is that a widely accepted equation?

A. Absolutely.

Q. Is it possible that someone could come to a contrary position with respect to whether it is possible to move that much steam through the piping?

A. Only if they -- excuse me. Only if they have the same steam expertise and experience that I do. People that have that expertise are going to agree with me.

Q. Other than that additional opinion, are there any other opinions that you plan on testifying to in this case?

A. I can't delineate anything specifically right now. But, again, there's more discovery coming in, more deps. We have a site visit that we just talked about off the record. So there may be other issues. Again, I can't tell you what they are right now. There may be, there may not be. I don't know.

Q. Is there any information that if you were to see, that would cause you to retract any of your opinions in this case?

MR. LOMAX: Objection to the form of the question.

A. It's going to be a really hard sell. I'm not saying it won't happen, but it's going to be a hard sell.

Q. I -- I understand you're convinced, but my -- my question is, is there any information that if it were provided to you, would cause you to change your opinions?

MR. LOMAX: Objection to the form of the question.

Q. Or opinion and/or opinions in this matter?

A. Some of the concrete and -- issues I raised about the existence of the heat exchanger is one that comes immediately to mind.

Q. Anything else?

A. Not that I can think of right now. There may be others, but I'm just -- I'm drawing a blank right now.

Q. Is there anything that we've not discussed today that you think is pertinent to this case?

MR. LOMAX: Objection to the form of the

question.
A. It may be pertinent and it may not be, but I am concerned about some of the safety issues relative to the E-Cat. If it is a nuclear reaction, excuse me, I'm concerned about the health physics issues, if it is, in fact, a nuclear reaction.
And then just as general boiler issues, again, in looking at the pictures of it and so forth, I'm fearless and it scares the crap out of me.
Q. The E-Cat does?
A. It does.
Q. How come?
A. It doesn't look like a properly constructed pressure vessel. Even though there's no alleged pressure in it, there are safety devices that all boilers should have that if they're there, fine, but I didn't see any evidence of them.
Q. Such as?
A. Over-pressure, over-temperature, thermal cutouts, things like that. You know, the normal safety devices one sees in a boiler, even a small, low pressure boiler.
And all -- and the other -- and the other thing is that in a document in there, in my stuff that I gave you that was not provided by counsel is -- from

what I can tell, the State of Florida has no record of that boiler existing at that location, at least not that I've been able to determine.

Q. What have you done to determine that?

A. I checked on the state's record, their website, for boiler licenses, boiler permits, operating inspections.

Q. But you're aware that the State of Florida went out there and did an inspection --

A. Different department. No, this -- this was the radiologic department. The Florida -- the Florida boiler department, I believe, is part of Financial Services. And I think they would be very, very interested in a device that makes hot water or allegedly superheated steam. I think they would be very interested in knowing about that.

Q. Okay. And who have you contacted there?

A. I have not.

Q. So how did you come to the conclusion that there is no record of there being a boiler device at that location?

A. A website search of the State of Florida's boiler division license records.

Q. And what does that tell you?

A. That they -- that somebody did not either --

well, for whatever reason, did not contact the state and apply for a boiler license and inspection as is required by Florida law, at least as I understand Florida law.

Q. You would agree this is a nontraditional boiler, would --

A. It makes no difference. The heat source is irrelevant to the fact that it's a boiler. Yeah, I agree, it is nontraditional, no argument there. But from -- from the jurisdictional standpoint, they don't make that distinction that -- that we might.

Q. Okay. What -- at what point or what determines when you need a boiler license?

A. The law, the Florida law.

Q. Okay. But I have a water heater in my house; is that a boiler?

A. They're -- no. And they make specific -- technically, it is a boiler. All right. Technically, all of our water heaters are a boiler. Okay. Because of the logistics involved and so forth, most all jurisdictions have a floor below which they're -- they -- you know, they say, you've got to have this and that on them, but they don't require inspections.

Q. And what's that floor?

A. I don't know. But typically -- I'm going to guess, okay, subject to verification with the law, typically it's about 85 gallons where you -- when you switch over from a typical -- like a 40 -- big 40, 80 -- or maybe even a little higher because I have an 80 gallon, maybe it's 120, but at some point you go from being a residential to more of a commercial, like for a small school, apartment building, things like that. You know, where it becomes a public occupancy is typically where that break point is made.

Q. Do you know what regulations apply to the E-Cat device?

A. As far as I know, the Florida boiler law applies because it is considered, again, depending on how we want to deal with it, a low pressure steam boiler or a hot water boiler.

Q. And what do you base your opinion that the Florida boiler law applies on --

A. Because this device is making hot water, and its size. And if it's a lot bigger -- as you mentioned, it's a lot bigger than an 80 horsepower commercial boiler, which absolutely requires a license.

Q. Now, commercial boilers operate under pressure, do they not?

A. They -- there is a -- they do operate under pressure. But the code, as I read the code -- and, you know, you're a lawyer, you may read it and come to an entirely different conclusion; but as I read the code, the pressure is immaterial as far as it being a boiler.

There is a -- the ASME has a break point at 15 PSIG. Below 15, it's a low-pressure boiler. Above 15, they call it a high-pressure boiler.

So zero is still -- and, again, when you were -- when we were wrangling about the pressures, you were showing pressure over zero on the lower atmospheric, that is pressure.

Q. For -- the standard boiler is the one depicted in your report, what is the average pressure that they operate under?

A. Tough question to answer. If it's -- if it's a typical, again, light commercial boiler, it's going to be a low-pressure boiler under 15, they typically run them around 12.

If it's for an industrial -- when I say "12," PSIG. If it would be for a commercial application like a laundry or a dry-cleaner, maybe 75, 80 pounds, something like that.

Q. Okay. So 12 PSIG is how many bars?

A. A little less than 1, because a bar is 14.7, so it's whatever --

Q. So it's operated under the vacuum?

A. Pardon? No. No. No. No. No. That's 14 -- I'm talking 15 PSIG.

MR. LOMAX: Objection. At this point, I just learned that you completed the deposition in terms of time.

MR. ANNESSER: Okay. Can I finish up this couple short questions?

MR. LOMAX: Yeah. It's over by three minutes already.

MR. ANNESSER: Nobody alerted me. I apologize.

BY MR. ANNESSER:

Q. Sir, do you mind --

A. No, not at all.

Q. -- just finishing the last couple questions?

A. No problem.

Q. 12 PSIG you said is a little under 1?

A. 1 bar gauge. 1 bar gauge. Okay. So -- let me -- I stand corrected. It would be a little under 2 bar gauge. And, again, that's because I use PSIG and I get a little -- I've got to think real carefully doing the transition from gauge to bar.

But that pressure would be above atmospheric at some point.

MR. ANNESSER: Okay. And I am out of

questions, sir. Thank you very much for your time today. You have the right to read or waive.

MR. LOMAX: We'll read.

THE WITNESS: We'll read.

MR. ANNESSER: Okay. Thank you very much.

MR. LOMAX: No questions.

But I -- before we go off the record, sir, if we could please designate this testimony as highly confidential at this point.

MR. ANNESSER: On what basis?

MR. LOMAX: We're just talking about, I think, just to be cautious before we can actually read the transcript. I think he might have gotten into some highly confidential information.

Do you have an objection?

MR. ANNESSER: Well, I object to it, but we can figure it out later. You can make the designation, but we'll -- we will object to it at this point in time and go from there.

THE VIDEOGRAPHER: We're off the record. The time is 1740.

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Thereupon, the testimony of February 27, 2017, was concluded at 5:40 p.m.

\- - -

CERTIFICATE

STATE OF OHIO:
SS:
COUNTY OF DELAWARE:

I, Tracy J. Schell, a Notary Public in and for the State of Ohio, duly commissioned and qualified, do hereby certify that the within-named RICK A. SMITH, P.E., was first duly sworn to testify to the truth, the whole truth, and nothing but the truth in the cause aforesaid; that the testimony then given was reduced to stenotypy in the presence of said witness, afterwards transcribed; that the foregoing is a true and correct transcript of the testimony; that this deposition was taken at the time and place in the foregoing caption specified.

I do further certify that I am not a relative, employee or attorney of any of the parties hereto; that I am not a relative or employee of any attorney or counsel employed by the parties hereto; that I am not financially interested in the action; and further, I am not, nor is the court reporting firm with which I am affiliated, under contract as defined in Civil Rule 28(D).

In witness whereof, I have hereunto set my hand and affixed my seal of office at Lewis Center, Ohio, on this 9th day of March, 2017.

Tracy J. Schell

Tracy J. Schell
Notary Public, State of Ohio.

My commission expires: November 5, 2018

ERRATA SHEET

RE : Rossi, Andrea v. Darden, Thomas
DEPO OF: Rick A. Smith, P.E.
TAKEN : 2/27/2017

DO NOT WRITE ON TRANSCRIPT, ENTER ANY CHANGES HERE

Page #	Line #	Change	Reason

State of Florida)
County of Dade)

Under penalties of perjury, I declare that I have read my deposition transcript, and it is true and correct subject to any changes in form or substance entered here.

______________ ____________________________

Date WITNESS NAME

b

d

FLORIDA RULES OF CIVIL PROCEDURE

Rule 1.310

(e) Witness Review. If the testimony is transcribed, the transcript shall be furnished to the witness for examination and shall be read to or by the witness unless the examination and reading are waived by the witness and by the parties. Any changes in form or substance that the witness wants to make shall be listed in writing by the officer with a statement of the reasons given by the witness for making the changes. The changes shall be attached to the transcript. It shall then be signed by the witness unless the parties waived the signing or the witness is ill, cannot be found, or refuses to sign. If the transcript is not signed by the witness within a reasonable time after it is furnished to the witness, the officer shall sign the transcript and state on the transcript the waiver, illness, absence of the witness, or refusal to sign with any reasons given therefor. The deposition may then be used as fully as though signed unless the court holds that the reasons given for the refusal to sign require rejection of the deposition wholly or partly, on motion under rule 1.330(d)(4).

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VERITEXT LEGAL SOLUTIONS
COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

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LICENSE AGREEMENT

THIS LICENSE AGREEMENT (this "**Agreement**"), is made and entered into as of October 26th, 2012 by and among LEONARDO CORPORATION, a New Hampshire Corporation ("**Leonardo**"), ANDREA ROSSI ("**Rossi**"), AMPENERGO, INC., an Ohio corporation ("**AEG**"), and INDUSTRIAL HEAT, LLC, a Delaware limited liability company (the "**Company**"). Each of Leonardo, Rossi, AEG and the Company are referred to herein as a "**Party**" and collectively as the "**Parties.**"

WHEREAS, Leonardo and/or Rossi are the sole owners of the patents, designs, trade secrets, technology, know-how (including all the knowledge necessary to produce thermal energy by means of apparatuses derived from the technology), products and business plans and all other intellectual property related directly or indirectly to energy production and conversion technologies and to the development, manufacture and sale of products using such technologies, including the Energy Catalyzer ("**E-Cat**") the catalyzer formula used to fuel the E-Cat, the "Hot Cat" and related energy production and conversion technologies (collectively, the "**E-Cat IP**"), and Leonardo is the producer of certain components of such systems (the "**E-Cat Products**"), as to which all such E-Cat IP and E-Cat Products, including, without limitation, the 1 MW E-Cat Product and the Hot Cat, are described in further detail on <u>Exhibit A</u> hereof, and

WHEREAS, Leonardo, Rossi and AEG entered into an agreement dated April 7, 2011, a copy of which is attached hereto as <u>Exhibit B</u> (the "**AEG Agreement**"), pursuant to which Leonardo and Rossi agreed to grant to AEG the exclusive right to "commercially market, sell the ECAT Technologies and License of manufacturing in the Americas" for the term set forth therein, and

WHEREAS, Leonardo, Rossi and AEG desire to grant to the Company an exclusive license to utilize the E-Cat IP and to manufacture and sell the E-Cat Products in the Territory as set forth herein, and

WHEREAS, Leonardo and Rossi desire to grant to the Company a right of first offer to acquire any license for E-Cat IP and E-Cat Products outside the Territory that Leonardo or Rossi may elect to offer, subject to certain terms and conditions, should Leonardo and/or Rossi decide to sell any such assets;

NOW THEREFORE, in consideration of the mutual covenants and agreements set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto hereby agree as follows:

1. **Grant of License and Sale of 1MW E-CAT Unit**

   Subject to the terms and conditions of this Agreement, Leonardo and Rossi hereby grant to the Company the exclusive right and license under the Patents and other E-Cat IP to develop, manufacture, make, have made, use, have used, offer to sell, have offered for sale, sell, have sold, import, and have imported all the products deriving from the E-Cat IP in the Territory (the "**License**"). The License specifically does not include any military applications in Italy. Leonardo and Rossi further grant to the Company the right to grant sublicenses of any of its rights under this Agreement. The

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EXHIBIT B

EXHIBIT "E"

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granting of sublicenses shall be at the Company's sole and exclusive discretion and the Company shall have the sole and exclusive power to determine the identity of any sublicensee, the applicable license fees or royalty rates, if any, and other terms and conditions of the sublicense.

1.1 This Agreement shall commence as of the date hereof and, unless earlier terminated in accordance with the terms hereof, will remain in effect for the period of the License. The License shall commence on the date provided in Section 3.2(b) below and shall remain in force for the following term:

- as for the Licensed Patents, on a country-by-country basis until the expiration of the last Valid Claim to expire of the Licensed Patent covering such country; and
- as for all other E-Cat IP, the duration will be unlimited.

1.2 On the terms set forth herein, Leonardo will manufacture and sell and deliver to the Company a 1MW E-CAT Unit, or at the election of the Company, a "Hot Cat" Unit, each as described in Exhibit C (such unit as is elected by the Company is hereafter referred to as the "**Plant**").

1.3 At the expiration of the last patent to expire under the Licensed Patents in any country in the Territory, provided the Company is not at that time in breach of this Agreement, the Company shall continue to have a completely paid-up, royalty-free right and license to subsequently develop, manufacture, make, have made, use, have used, offer to sell, have offered for sale, sell, have sold, import, and have imported all the products deriving from the E-Cat IP in that country.

2. Territory

This License is valid for the following territories (the "Territory"):

- North America, Central America and Caribbean, South America
- China
- Russia
- Saudi Arabia
- Arabian Emirates

3. Price and Payments

3.1 The total price for the grant of the License and the purchase of the Plant is One Hundred Million Five Hundred Thousand Dollars ($100,500,000).

3.2 The payment terms will be as follows:

(a) Upon execution of this Agreement, the Company will pay to Leonardo One Million Five Hundred Thousand Dollars ($1,500,000), which amount shall be deemed to include payment in full for the Plant. In the event the Plant is not delivered or Validation is not achieved within the time period set forth in Section 4, the full $1,500,000 will be refunded to the Company within two business days of its request. A refund of the $1,500,000 will not be provided for any other reason and no other refund will be provided for any reason. In the event the $1,500,000 is refunded, the Plant will remain the property of Leonardo. The Plant must be available for Validation and delivery within 120 Business Days following the date of this Agreement and will be delivered to the location specified by the Company, at Leonardo's expense, within thirty Business Days following Validation. Concurrently with delivery of the Plant, Leonardo will execute and deliver a customary bill of sale providing for a lien free sale and transfer of the Plant to the Company.

(b) Provided that such date is at least 120 Business Days following the date of this Agreement (unless otherwise agreed by the Company), within five Business Days following (a) notification to the Company that the Plant is complete and ready for Validation, and (b) satisfaction of the Conditions Precedent, the Company will deliver Ten Million Dollars ($10,000,000) to TD Bank, at its office in Miami Beach, Florida, USA (or another bank agreed upon by Leonardo and the Company), to be held in escrow pursuant to an escrow agreement acceptable to Leonardo and the Company. Such escrow agent (the "Escrow Agent") shall pay the escrowed $10,000,000 to Leonardo immediately after (i) Validation is achieved as provided in Section 4 hereof, and (ii) the E-Cat IP has been validated and is available for immediate delivery to the Company in accordance with the procedures set forth in Schedule 3.2(b) attached hereto. The escrow agreement will include appropriate provisions authorizing such payment in compliance with the preceding sentence. On the date the Escrow Agent pays the $10,000,000 to Leonardo, the License will commence and Leonardo and Rossi will immediately transfer, and the Validation Agent (as defined in Schedule 3.2(b)) will deliver, to the Company all E-Cat IP. If Validation is not achieved within the time period set forth in Section 4 or the E-Cat IP is not validated in accordance with the procedure set forth on Schedule 3.2(b), the Company may instruct the Escrow Agent to return the $10,000,000 to the Company and may terminate this Agreement and be released from any liability hereunder.

(c) Within five business days following 350 days of operation of the Plant during which the Guaranteed Performance has been achieved as required by Section 5 below, the Company will pay to Leonardo Eighty Nine Million Dollars ($89,000,000); provided, however, that if, prior thereto (i) any Person has entered the market with a product that infringes the E-Cat IP, or (ii) any product of the Company that utilizes the E-Cat IP infringes the patent or other intellectual property rights of any third-party, at the election of the Company, the Company will pay to Leonardo, in lieu of the foregoing $89,000,000 payment, within five business days following 350 days of operation of the Plant during which the Guaranteed Performance has been achieved as required by Section 5 below, Forty-four Million Five Hundred Thousand Dollars ($44,500,000) and Leonardo will be entitled to receive a five percent (5%) royalty on net sales by the Company of E-Cat Products or energy produced by E-Cat Products, payable annually on each January 31 with respect to the previous 12 months ended December 31, until aggregate compensation paid to Leonardo pursuant to this Agreement equals $1 billion. Any royalty payments made in accordance with the foregoing sentence will be accompanied by supporting financial information generated by the Company in the ordinary course of its business.

(d) All payments due hereunder shall be made in immediately available funds in accordance with wire transfer instructions to be provided by the party entitled to receive payment.

4. **Validation of the Plant**

Retention by Leonardo of the $1,500,000 component of the purchase price and payment of the $10,000,000 described in Section 3.2(b) above are subject to successful Validation of the Plant. The Validation will be made in the factory of Leonardo within 120 Business Days following the date of this Agreement on a date mutually agreed to by the Company and Leonardo. "Validation" will be deemed successful and achieved when the expert responsible for such validation (ERV) certifies in writing that during a 24 hour test period the Plant consistently produces energy that is at least six times greater than the energy consumed by the Plant (the "Energy Multiple") and the temperature of the steam produced by the Plant is consistently 100 degrees Celsius or greater. To make this measurement the ERV will measure the flow of the heated fluid and the Delta T between the temperature of the fluid before and after the E-CAT reaction. The ERV will be chosen by mutual agreement between Leonardo and the Company and Leonardo and the Company shall bear the ERV's costs fifty-fifty. At their respective elections, the Company and Leonardo may have representatives present to observe the Validation process and discuss the testing and its results with the ERV.

5. **Guaranteed Performance.**

Payment of the amount set forth in Section 3(c) above is contingent upon the Plant operating at the same level (or better) at which Validation was achieved for a period of 350 days (even if not consecutive) within a 400 day period commencing on the date immediately following delivery of the Plant to the Company ("Guaranteed Performance"). Each of Leonardo and Rossi will use their commercially reasonably best efforts to cause Guaranteed Performance to be achieved, including making repairs, adjustments and alterations to the Plant as needed to achieve Guaranteed Performance. The ERV (or another party acceptable to the Company and Leonardo) will be engaged to confirm in writing the Guaranteed Performance. Guaranteed Performance will not be deemed achieved unless such written confirmation is received or waived by the Company. In the event Guaranteed Performance is not achieved within the time period set forth in this Section (as such time period may be extended by the Company in its sole discretion), but the ERV confirms that during such time period the Plant consistently produced energy that is at least four times greater than the energy consumed by the Plant and that the temperature of the steam produced by the Plant was consistently 100 degrees Celsius or greater, then the amount payable by the Company pursuant to Section 3(c) above shall be reduced in proportion to the reduction in the Energy Multiple, and the total purchase price set forth in Section 3.1 shall be reduced accordingly. If neither the foregoing standard nor Guaranteed Performance is achieved, the Company shall not be required to pay any amount pursuant to Section 3(c) above and the total purchase price set forth in Section 3.1 shall be reduced accordingly.

6. **Conditions Precedent**

The Company's obligation to pay the $10,000,000 described in Section 3.2(b) above is subject to satisfaction of the following conditions (the "Conditions Precedent") as determined by the Company based upon commercially reasonable standards, or the waiver of any one or more of such conditions by the Company in its sole discretion:

(a) Receipt of evidence that all E-Cat IP is owned by Leonardo and/or Rossi.

(b) Receipt of evidence of the corporate authority of Leonardo to enter into this Agreement and perform its obligations hereunder.

(c) Confirmation that the representations and warranties of Leonardo and Rossi set forth herein are true and correct.

(d) All representations and warranties of Leonardo and Rossi shall be true and correct as if made on and as of the date of payment of the $10,000,000 and Leonardo and Rossi shall have delivered to the Company written certification that the representations and warranties of Leonardo and Rossi set forth herein are true and correct as of the date payment is made.

Leonardo and Rossi agree to provide the Company with such information and documentation as it may reasonably request to satisfy the Conditions Precedent. In the event the Conditions Precedent are not satisfied on or prior to the date that is 60 Business Days following the date of this Agreement, the Company will be entitled to suspend its obligations hereunder until such Conditions Precedent are satisfied or waived by the Company or to terminate this Agreement and be released from any liability hereunder; provided, however, that if the Condition Precedent set forth in Section 6(e) above is not satisfied within such 60 Business Day period, the Company will either waive the condition and proceed as otherwise set forth herein or terminate this Agreement.

7. Patent Prosecution and Maintenance

7.1 For each patent application and patent under the Licensed Patents, Leonardo shall:

(a) prepare, file and prosecute such patent application;
(b) maintain such patent;
(c) pay all fees and expenses associated with its activities pursuant to Sections 7.1(a) and (b) above;
(d) keep the Company currently informed of the filing and progress in all material aspects of the prosecution of such patent application, and the issuance of patents from any such patent application;
(e) consult with the Company concerning any decisions which could affect the scope or enforcement of any issued claims or the potential abandonment of such patent application or patent; and
(f) notify the Company in writing of any additions, deletions or changes in the status of such patent or patent application.

The Company, at its election and at its expense, may participate in patent prosecution and maintenance as set forth above to the extent it deems necessary or desirable.

7.2 If Leonardo wishes to abandon any patent application or patent that is a Licensed Patent, it shall give the Company ninety (90) days prior written notice of the desired abandonment. Leonardo shall not abandon any such Licensed Patent except upon the prior written consent of the Company. On the Company's request, which may be provided at any time after the notice of desired abandonment, Leonardo shall assign to the Company any such patent application and patent Leonardo wishes to abandon.

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Effective as of the effective date of such assignment, such patent application and patent shall no longer be a Licensed Patent.

8. Third-Party Infringement.

8.1 A Party receiving notice of alleged infringement of any Licensed Patent in the Territory, or having a declaratory judgment action alleging invalidity or noninfringement of any Licensed Patent in the Territory brought against it, shall promptly provide written notice to the other Parties of the alleged infringement or declaratory judgment action, as applicable.

8.2 Leonardo shall bring suit or defend a declaratory judgment action and control the conduct thereof, including settlement, to stop infringement of any Licensed Patent; provided, however, that Leonardo shall only be required to take such action after (i) notification from the Company advising that it believes such action to be necessary or advisable, and (ii) only as and to the extent deemed to be appropriate by an independent patent attorney selected by Leonardo. Leonardo may force the Company to become a party to the suit or action only if a court of competent jurisdiction determines the Company is an indispensable party to the suit. Leonardo shall (a) hold the Company free, clear and harmless from any and all costs and expenses of the suit, including reasonable attorneys' fees, and (b) compensate the Company for the reasonable time and expenses of the Company's employees for any required assistance or testimony of the Company's members, managers, officers, and employees in connection with the suit. The Company may voluntarily initiate or participate in any suit or defense of a declaratory judgment at the Company's election and at its expense as the Company may deem appropriate to enforce or protect its rights or interests under this Agreement.

9. Regulatory Clearance. Leonardo, Rossi, and AEG, each to the extent requested by the Company, shall reasonably cooperate with the Company in obtaining any clearances or licenses from governmental agencies or regulatory authorities to own, possess, make, operate, sell, or export the E-Cat IP or the E-Cat Products.

10. Recordation of License. Upon the request of the Company, Leonardo and Rossi shall assign to the Company the Licensed Patents with respect to the Territory or, if so requested by the Company, record this Agreement (or a memorandum hereof, or similar document) as permitted or required by the laws of countries in the Territory, and any recordation fees and related costs and expenses shall be paid by Company.

11. Mutual Representations and Warranties.

Each Party hereby represents and warrants to the other party that:

(a) it is duly organized, validly existing and in good standing as a corporation or other entity as represented herein under the laws and regulations of its jurisdiction of incorporation or organization;

(b) it has, and throughout the term of the License shall retain, the full right, power and authority to enter into this Agreement and to perform its obligations hereunder;

(c) the execution of this Agreement by its representative whose signature is set forth at the end hereof has been duly authorized by all necessary corporate or limited liability company action of the Party; and

(d) when executed and delivered by such Party, this Agreement shall constitute the legal, valid and binding obligation of that Party, enforceable in accordance with its terms.

12. Representations and Warranties of Leonardo and Rossi.

Leonardo and Rossi, jointly and severally, each hereby represents and warrants to the Company that:

(a) Leonardo and/or Rossi are the sole and exclusive legal and beneficial owners of the entire right, title, and interest in and to the E-Cat IP and are the record owners of all patent applications and issued patents that are Licensed Patents, have good and valid record and marketable title to the E-Cat IP, have not licensed the E-Cat IP to any other party and are under no express or implied obligation to any third party that would restrict, limit, or in any manner effect the ability to license the rights to the E-Cat IP, and have and throughout the Term will retain the full, unconditional and irrevocable right, power and authority to license the E-Cat IP as provided herein, free and clear of any Liens.

(b) The patents and patent applications indentified on Exhibit A and all other E-Cat IP, all of which is to be delivered to the Company in accordance with Section 3.2(b), are owned by Leonardo and/or Rossi and are all the patents and patent applications and other intellectual property that are necessary or useful for the Company to develop, manufacture, make, have made, use, have used, offer to sell, have offered for sale, sell, have sold, import, and have imported all the products deriving from the E-Cat IP in the Territory.

(c) A list of all agreements in any way related to the E-Cat IP or the E-Cat Products, including any and all sales or licensing agreements, is set forth on Exhibit D attached hereto. Complete copies of all such agreements have been delivered to the Company.

(d) Neither Leonardo nor Rossi has granted, and neither of them will grant, any licenses or other contingent or non-contingent right, title or interest under or relating to the Licensed Patents or other E-Cat IP, including any such license, right, title or interest that permits or would permit any party to manufacture, sell, or distribute E-Cat Products in the Territory or use the E-Cat IP in the Territory, or is or will be under any obligation, that does or will conflict with or otherwise affect this Agreement, including any of Leonardo or Rossi's representations, warranties or obligations hereunder or the Company's rights or license hereunder. The Company is aware of the AEG Agreement.

(e) There neither are, nor at any time during the term of the License will be, any encumbrances, liens or security interests created or permitted by Leonardo or Rossi involving any Licensed Patents or the other E-Cat IP.

(f) The execution and delivery of this Agreement and the consummation of the transactions contemplated hereby does not (i) result in the imposition of any Lien under, cause the acceleration of any obligation under, or violate or conflict with the terms, conditions or provisions of any contracts or other agreements to which Leonardo or Rossi is a party or by which either of them is bound, (ii) result in a breach or violation as of the date of this Agreement by Leonardo or Rossi of any of the terms, conditions or provisions of any Law or Order, or (iii) require the provision of any payment or other consideration to any third party by Leonardo or Rossi, other than pursuant to the AEG Agreement.

(g) To the knowledge of Leonardo and Rossi, none of the E-Cat IP infringes upon the rights of any other Person nor has the E-Cat IP been infringed upon by any other Person and there is no prior art or other information that would adversely affect the validity, enforceability, term or scope of any Licensed Patent. All rights in the E-Cat IP are valid and in full force and effect and no approval or consent of any Person is needed for the interest of the Company in the rights in the E-Cat IP to continue to be in full force and effect following the date hereof and the transactions contemplated by this Agreement. Leonardo has not taken any action or omitted to take any action which would adversely affect the validity of the rights in the E-Cat IP.

(h) The AEG Agreement does not in any way restrict or inhibit the ability of Leonardo to grant the License as provided herein.

(i) There is no Action or Proceeding or Order pending or, to the knowledge of Leonardo or Rossi, threatened against Leonardo or Rossi which relates to or could impact the E-Cat IP, or to which Leonardo or Rossi is subject or by which any of their assets are bound. There is no settled, pending or threatened litigation or re-examination, post-grant or *inter partes* review, interference, derivation, opposition, claim of invalidity or other claim or proceeding (including in the form of any offer to obtain a license): (i) alleging the invalidity, misuse, unregistrability, unenforceability or noninfringement of any Licensed Patent; (ii) challenging the ownership of, or right to practice or license, any Licensed Patent, or alleging any right, title or interest with respect thereto; or (iii) alleging that the practice of any Licensed Patent or the making, using, offering to sell, sale or importation of any E-Cat Product in the Territory does or would infringe, misappropriate or otherwise violate any patent, trade secret or other intellectual property of any third party. Neither Leonardo nor Rossi has any knowledge, after reasonable investigation, of any factual, legal or other reasonable basis for any litigation, claim or proceeding described in this paragraph.

(j) Each of Leonardo and Rossi has filed within the time prescribed by law or regulations all tax returns or reports, and has paid all taxes required by any jurisdiction or subdivision or agency thereof, in each case attributable to periods on or prior to the execution of this Agreement, with respect to and to the extent of its ownership and/or use of the E-Cat IP.

(k) Leonardo is not in violation of any Law or Order to which the E-Cat IP is subject.

(l) The cost to produce the Plant that will be delivered to the Company pursuant to this Agreement, assuming high scale production volumes, will not exceed \$100/kW and the maximum cost to fuel the Plant on the date hereof is \$10 per 10kW of output.

(m) All of the books and records and other documents to be delivered to the Company pursuant to this Agreement will be true, correct and complete in all material respects.

(n) None of Leonardo, Rossi or any other shareholder, director, officer or employee of Leonardo (i) is a Person appearing on the Specially Designated Nationals and Blocked Persons List of the Office of Foreign Assets Control in the United States Department of the Treasury, (ii) is any other Person with whom a transaction is prohibited by applicable provisions of the USA PATRIOT Act, the Trading with the Enemy Act or the foreign asset control regulations of the United States Treasury Department, in each case as amended and in effect from time to time, (iii) is controlled by any Person described in the foregoing items (i) or (ii), with ownership of 20% or more of outstanding voting securities being presumptively a control position for purposes of this clause, and (iv) has its principal place of business located in any country described in the foregoing item (ii). Further, neither Leonardo nor Rossi has entered into any written or oral agreements relating in any way to the E-Cat Products or the E-Cat IP with any Person described in (i), (ii), (iii) or (iv) of the foregoing sentence.

13. Covenants and Agreements.

13.1 **Services by Rossi.** In consideration of the payments set forth herein, Rossi will provide ongoing training and support to the Company in the use of the Plant and the production of the E-Cat Products for a period of not less than twelve months following Validation, as and to the extent reasonably requested by the Company to enable it to utilize the E-Cat IP, operate the Plant and produce the E-Cat Products. Further, Rossi and the Company currently contemplate that the Company will engage Rossi as its chief scientist pursuant to a separate agreement to be entered into following Validation, in which event the services contemplated by the preceding sentence will be rendered pursuant to such engagement.

13.2 **Right of First Offer.** Leonardo and Rossi each hereby agrees that, should either of them desire at any time to license the E-CAT IP or the manufacture or distribution of E-Cat Products in any territory outside the Territory covered by this Agreement, they will first notify the Company and the Company will have a period of thirty (30) days to make an offer to purchase such license. In the event the Company makes such offer and Leonardo or Rossi does not accept it, Leonardo or Rossi may grant such license to another party only if the price paid by such party is at least 90% of the price offered by the Company and the other terms and conditions of the agreement are no less favorable to

Leonardo or Rossi than the terms proposed by the Company. In the event either of Leonardo or Rossi desires to enter into an agreement that does not satisfy the requirements set forth in the foregoing sentence, they must first offer the same agreement to the Company and the Company will have thirty days to accept or reject it. If the Company rejects it, Leonardo or Rossi may enter into that agreement with another party at any time during the following sixty (60) days, and, if they fail to do so, they must again provide the Company with the right of first offer before entering into a licensing agreement with any other party. Any licensing agreement entered into by Leonardo or Rossi regarding the E-CAT IP or the manufacture or distribution of E-Cat Products must include a provision prohibiting the manufacture, sale or distribution of E-Cat Products, and the use of the E-Cat IP, in the Territory.

13.3 **Covenant Not to Compete**. For as long as the Company or any of its subsidiaries is engaged in any business related to the E-Cat Products and Leonardo, Rossi or any Affiliate of Leonardo own any of the Company's equity ownership interests or Leonardo, Rossi or any Affiliate are performing services for the Company or such transferee (whether as an employee, consultant or otherwise and specifically including the period of services required by Section 13.1) and for an additional period of two (2) years after the last of Leonardo, Rossi or such Affiliate shall have ceased to provide such services, none of Leonardo, Rossi or any of their Affiliates will (except as an officer, director, stockholder, employee, agent or consultant of the Company or such subsidiary of the Company) directly or indirectly own, manage, operate, join, or have a financial interest in, control or participate in the ownership, management, operation or control of, or be employed or engaged as an employee, agent or consultant, or in any other individual or representative capacity whatsoever, or use or permit their names to be used in connection with, or be otherwise connected in any manner with any business or enterprise (a) engaged in the design, development, manufacture, distribution, lease, rental or sale of any E-Cat Products, or the provision of any services related thereto or (b) which is competitive with the E-Cat Products, unless Leonardo or such Affiliate shall have obtained the prior written consent of the Company or such subsidiary of the Company, as the case may be. In the event of termination of this Agreement due to a breach by the Company, the Company and all its affiliates, employees, officers, directors, for two (2) years after the period of effectiveness of this agreement, will not be allowed to work for a competitor of Leonardo in the licensing or sale of products competing with the E-Cat Products.

13.4 **After Acquired/Developed Assets, Intellectual Property Rights**. Leonardo and Rossi hereby agree that from and after the date hereof, any and all inventions, discoveries, concepts, ideas, information and anything else that Leonardo, Rossi or any of their Affiliates makes or develops which relate to the E-Cat IP or are useful in the business or activities in which the Company is or may become engaged, including without limitation, enhancements, improvements, alternations, additions, deviations, changes, variations, as well as all derivative works based on the E-Cat IP and any item or product embodying the E-Cat IP and all applications, names, titles, characters, symbols, designs, copyrights, patents, trademarks, artwork, and elements embodied in, derived from or related thereto and any other product, service, presentation, ancillary work or commercial endeavor including, without limitation, as represented in any and all media, and all third-party products using or incorporating the E-Cat IP and all embodiments of the foregoing (collectively, the "After Acquired/Developed Assets") shall be and shall remain within the scope of the definition of E-Cat IP and shall be included in the License. Leonardo and Rossi each hereby agrees to, and agrees to cause its Affiliates to, promptly assign, transfer and convey to Leonardo any and all right, title and interest in and to any such After Acquired/Developed Assets and intellectual property rights therein if such rights are not owned by Leonardo and to execute any and all intellectual property applications and instruments of conveyance and other documents, and to take all other steps necessary to vest Leonardo with the entire right, title and interest in and to the After Acquired/Developed Assets free and clear of all Liens. Further, it is acknowledged and agreed that, from and after the date the License commences, any and all inventions, discoveries, concepts, ideas, information and anything else that the Company, its sublicensees, or any of their affiliates, makes or develops which relate to the E-Cat IP or are useful in the business or activities in which the Company is or may become engaged, including without limitation, enhancements, improvements, alternations, additions, deviations, changes, variations, as well as all derivative works based on the E-Cat IP and any item or product embodying the E-Cat IP and all applications, names, titles, characters, symbols, designs, copyrights, patents, trademarks, artwork, and elements embodied in, derived from or related thereto and any other product, service, presentation, ancillary work or commercial endeavor including, without limitation, as represented in any and all media, and all embodiments of the foregoing shall be and shall remain the property of the Company (or such sublicensee or affiliate if so agreed by the Company).

13.5 **Tax Matters.** The Parties shall file all necessary documentation and returns with respect to any applicable sales, use, transfer, real property transfer, recording, gains, stock transfer and other similar taxes and fees pertaining to the respective revenues derived by the Parties in respect of the E-Cat IP (such taxes and fees, including any interest or penalties thereon, are herein sometimes called "E-Cat Taxes"). The Parties agree to defend and hold harmless each other Party from and against any Governmental or Regulatory Body action against one Party with respect to E-Cat Taxes payable by such Party and arising out of or in connection with the transactions effected pursuant to this Agreement. Each Party further agree to defend and hold harmless each other Party with respect to any additional E-Cat Taxes imposed by reason of any payment made by an indemnifying Party under this Section.

14. Indemnification.

15.1 Leonardo and Rossi shall indemnify, defend and hold harmless the Company and its members, managers, officers, directors, employees, agents, successors, assigns, and sublicensees (each, a "Company Indemnitee") against all losses arising out of or resulting from any third party claim, suit, action or proceeding related to, arising out of or resulting from any breach by Leonardo or Rossi of any representation, warranty, covenant or obligation of Leonardo or Rossi under this Agreement. The Company shall indemnify, defend and hold harmless Leonardo and Rossi, and their respective members, managers, officers, directors, employees, agents, successors, assigns and sublicensees (each a "Leonardo Indemnitee") against all losses arising out of or resulting from any third party claim, suit, action or proceeding related to, arising out of or resulting from any breach by the Company of any representation, warranty, covenant or obligation of the Company under this Agreement.

15.2 [Intentionally omitted]

15.3 The Company Indemnitee or the Leonardo Indemnitee, as the case may be, shall promptly notify in writing each Party responsible for indemnification of any claim subject to indemnification hereunder and cooperate with each indemnifying Party at such indemnifying Party's sole cost and expense. Each Party responsible for indemnification shall immediately take control of the defense and investigation of the claim and shall employ counsel reasonably acceptable to the Company Indemnitee or the Leonardo Indemnitee, as the case may be, to handle the defense of the same, at the sole cost and expense of the indemnifying Party or Parties. An indemnifying Party shall not settle any claim in a manner that adversely affects the rights of the indemnified Party without the indemnified Party's prior written consent, which shall not be unreasonably withheld or delayed. The failure of the Company Indemnitee or the Leonardo Indemnitee, as the case may be, to perform any obligations under this Section 15.3 shall not relieve any indemnifying Party of its obligation under this Section 15.3, except to the extent that the indemnifying Party can demonstrate that it has been materially prejudiced as a result of the failure. The Company Indemnitee or the Leonardo Indemnitee, as the case may be, may participate in and observe any proceedings that are the subject of this paragraph at such Party's own cost and expense with counsel of its choosing.

16. Miscellaneous.

16.1 **Certain Definitions.** As used in this Agreement, the following terms have the following meanings unless the context otherwise requires:

"Action or Proceeding" means any action, suit, proceeding or arbitration by any Person, or any investigation or audit by any Governmental or Regulatory Body.

"AEG Agreement" has the meaning set forth in the recitals to this Agreement.

"Affiliate" means with respect to any Person, any other person controlling, controlled by or under common control with such first Person, and with respect to any natural Person, includes such Person's spouse and other relatives by blood or marriage.

"Agreement" means this License Agreement.

"Business Day" means any day other than a day on which commercial banks in New York, New York are authorized or required by law to close.

"Company" has the meaning set forth in the recitals to this Agreement.

"Conditions Precedent" has the meaning set forth in Section 6 of this Agreement.

"E-Cat" has the meaning set forth in the recitals to this Agreement.

"E-Cat IP" has the meaning set forth in the recitals to this Agreement, and shall include all documents, manuals, technical data, formulae, and other items and materials necessary or useful to enable the Company to (i) operate the 1MW E-Cat Unit, (ii) make E-Cat Products, and (iii) exploit the E-Cat IP as contemplated by this Agreement.

"E-Cat Products" has the meaning set forth in the recitals to this Agreement.

"Governmental or Regulatory Body" means any court, tribunal, arbitrator or any government or political subdivision thereof, whether federal, state, county, local or foreign, or any agency, authority, official or instrumentality of any such government or political subdivision.

"Law" means any law, statute, rule, regulation, ordinance and other pronouncement having the effect of law of the United States of America, any foreign country or any domestic or foreign state, country, city or other political subdivision or of any Governmental or Regulatory Body.

"Licensed Patents" means the patents, patent applications, and patents pending designated as "Licensed Patents" on Exhibit A attached hereto, all patents issued from such patent applications and all continuations, continuations-in-part, divisions, extensions, substitutions, reissues, re-examinations and renewals of any of the foregoing, and any patents in the Territory issuing from any applications filed after the date of this Agreement that claim priority from any of the patents or patent applications designated as "Licensed Patents" on Exhibit A or from which any of the patents or patent applications designated as "Licensed Patents" on Exhibit A claim priority.

"Lien" means any lien, pledge, hypothecation, mortgage, security interest, claim, lease, charge, option, right of first refusal, easement, servitude, transfer restriction under any instrument, agreement, encumbrance or any other restriction or limitation of any nature or kind whatsoever.

"Order" means any writ, judgment, decree, injunction or similar order of any Governmental or Regulatory Body, in each case whether preliminary or final.

"Person" means any individual, corporation, partnership, firm, joint venture, association, joint-stock company, trust, unincorporated organization, Governmental or Regulatory Body or other entity.

"Plant" has the meaning set forth in Section 1.2 of this Agreement.

"Tax" and "Taxes" means all taxes or other assessments imposed by any federal, state or local taxing authority, including income, excise, property, sales, use, ad valorem, and franchise taxes other than E-Cat Taxes.

"Valid Claim" means, on a country-by-country basis, a claim of an unexpired issued or granted Licensed Patent so long as the claim has not been admitted by Leonardo or otherwise caused to be invalid or unenforceable through reissue, disclaimer or otherwise, or held invalid or unenforceable by a tribunal or governmental agency of competent jurisdiction from whose judgment no appeal is allowed or timely taken.

"Validation" has the meaning set forth in Section 4 of this Agreement.

"Watts", "kW", "MW"," GW": it is intended that in this Agreement Watts are always Thermal Watts, not Electric Watts.

16.2 **Expenses.** Except as otherwise expressly provided herein, whether or not the transactions contemplated by this Agreement shall be consummated, each of the parties hereto shall pay its own expenses (including, without limitation, attorney's and accountants' fees and out-of-pocket expenses) incident to this Agreement and the transactions contemplated hereby.

16.3 **Notices.** All notices, requests, demands and other communications required or permitted to be given hereunder shall be in writing and shall be given personally, sent by facsimile transmission or sent by prepaid air courier or certified registered mail, postage prepaid. Any such notice shall be deemed to have been given (a) when received, if delivered in person, sent by facsimile transmission and, in the case of facsimile, confirmed in writing within three (3) Business Days thereafter, or sent by prepaid Federal Express or other generally recognized prepaid air courier or (b) three (3) Business Days following the mailing thereof, if mailed by registered or certified first class mail, postage prepaid, return receipt requested, in each such case to the respective address as set forth on the signature page hereto (or to such other address or addresses as a party may have advised the other). A copy of all notices shall also be sent via e-mail, but the failure of any such notice by email to be received shall not affect notice otherwise validly given under this Agreement.

16.4 **Publicity; Confidentiality.** No publicity release or public announcement concerning this Agreement or the transactions contemplated hereby shall be made by Leonardo, Rossi, AEG or the Company without written advance approval thereof by each of Leonardo and the Company. While this Agreement is in effect and after this Agreement terminates, each party hereto and its Affiliates shall keep confidential, and shall not disclose, the terms of this Agreement to any other Person without the prior consent of each other Party hereto unless (i) the disclosure is required by law or legal process (including without limitation the federal securities laws and the rules and regulations of the Securities and Exchange Commission promulgated there under) or (ii) the disclosure is to any officer, director, employee or agent of any party hereto or of any of its Affiliates and such Person needs to know such information for purposes of consummating the transactions contemplated by or the performance of this Agreement. In the case of press conferences or press releases, Leonardo shall have the right to select or reject certain journalists, who will be a part thereof or who will receive such releases.

During the term of this Agreement, each of Leonardo, Rossi, and AEG agrees to keep the E-Cat IP strictly confidential and not disclose any of the E-Cat IP to any other party; provided, however, that Leonardo and/or Rossi may disclose the E-Cat IP (i) to its employees as necessary in connection with the business of Leonardo and/or Rossi, provided that such business does not violate the provisions of this Agreement and further provided that such employees enter into a confidentiality agreement requiring them to keep the E-Cat IP strictly confidential, and (ii) in connection with any license agreement entered into in accordance with the procedure set forth in Section 13.2 hereof, provided that such disclosure is made only to the extent necessary to permit such licensee to utilize the license granted and such licensee enters into a confidentiality agreement requiring it to keep such E-Cat IP strictly confidential. Any confidentiality agreement entered into with an employee or licensee as contemplated in the preceding sentence shall include a provision stating that the Company is a third party beneficiary of such confidentiality agreement and may enforce the terms thereof. Each of Leonardo, Rossi, and AEG acknowledges that unauthorized use or disclosure of the E-Cat IP may result in irreparable damage to the Company. Accordingly, the Parties agree that injunctive relief shall be an appropriate remedy in the event of any breach or threatened breach of this paragraph, in addition to money damages or such other remedies as may be available with respect to such breach or threatened breach.

16.5 **Bankruptcy.** All rights and licenses granted under this Agreement are and shall be deemed to be "embodiment(s)" of "intellectual property" for purposes of, and as such terms are used in and interpreted under, Section 365(n) of the United States Bankruptcy Code (the "Bankruptcy Code"). The Company shall have the right to exercise all rights and elections with respect to the E-Cat IP and all E-Cat Products. Without limiting the generality of the foregoing, each of Leonardo and Rossi acknowledges and agrees that, if Leonardo or Rossi (or Rossi's estate) shall become subject to any bankruptcy or similar proceeding: (a) subject to the Company's rights of election, all rights and licenses granted to the Company hereunder will continue subject to the terms and conditions of this Agreement, and will not be affected, even by Leonardo's or Rossi's rejection of this Agreement, and (b) the Company shall be entitled to a complete duplicate of (or complete access to, as appropriate) all such intellectual property and embodiments of intellectual property comprising or relating to any E-Cat IP or E-Cat Products, and the same, if not already in the Company's possession, shall be promptly delivered to the Company, unless Leonardo elects to and does in fact continue to perform all of its obligations under this Agreement.

16.6 **AEG.** By joining into this Agreement as a Party, AEG acknowledges the terms of this Agreement, agrees that this Agreement does not violate the provisions of the AEG Agreement, agrees that the rights granted to AEG under the AEG Agreement do not and will not infringe upon or interfere with the License, agrees to indemnify and hold harmless the Company from and against any claim or dispute arising between AEG and Leonardo or Rossi in connection with the AEG Agreement or otherwise, and agrees to indemnify Leonardo and Rossi from and against any claim or dispute arising between AEG and the Company in connection with this Agreement or otherwise. All Parties hereby acknowledge and agree that the payments due to AEG pursuant to the AEG Agreement with respect to this Agreement will be made directly by the Company to AEG pursuant to a separate agreement to be entered into between AEG and the Company. The amounts payable to Leonardo hereunder reflect the fact that Leonardo will not make any payments to AEG under the AEG Agreement. AEG further acknowledges that upon execution of this Agreement and compliance by the Company with the provisions set forth herein, AEG will have no further rights under the AEG Agreement to market or sell the E-Cat IP or the license to manufacture of the E-Cat Products; provided, however, that in the event this Agreement is terminated by the Company for any reason or by Leonardo or Rossi due to the Company's failure to comply with the provisions of this Agreement, the AEG Agreement will be deemed reinstated in full and shall thereafter remain in full force and effect in accordance with its terms, except that no amount shall be payable under the AEG Agreement by Leonardo with respect to this Agreement.

16.7 **Assignment.** Other than the Company's right to sublicense as provided in Section 1, neither Leonardo nor Rossi, nor the Company, shall assign or otherwise transfer any of its rights, or delegate or otherwise transfer any of its obligations or performance under this Agreement, in each case whether voluntarily, involuntarily, by operation of law or otherwise, without the other party's prior written consent. No delegation or other transfer will relieve Leonardo or Rossi or the Company of any of their obligations or performance under this Agreement. Any purported assignment, delegation or transfer in violation of this Section 16.7 is void. This Agreement is binding upon and inures to the benefit of the Parties and their respective permitted successors and assigns.

16.8 **Entire Agreement.** This Agreement (including the Exhibits and Schedules hereto) and the other agreements, certificates and documents specifically incorporated herein by reference thereto, or delivered pursuant to this Agreement contain the entire agreement among the parties with respect to the transactions described herein, and supersede all prior agreements, written or oral, with respect thereto.

16.9 **Waivers and Amendments.** This Agreement may be amended, superseded, canceled, renewed or extended, and the terms hereof may be waived, only by a written instrument signed by the Parties or, in the case of a waiver, by the Party waiving compliance. No delay on the part of any Party in exercising any right, power or privilege hereunder shall operate as a waiver thereof.

16.10 **Governing Law and Dispute Resolution.** This Agreement shall be construed and enforced under the laws of the State of Florida without regard to the conflicts of law principles thereof that would defer to or result in the application of the substantive laws of another jurisdiction. Any controversy or claim arising out of or relating to this Agreement, or the breach thereof, shall be settled exclusively by the Court of Miami, Florida, USA.

16.11 **Force Majeure.** Neither Party shall be liable for any delay in the performance of its obligations hereunder to the extent such delay is due to events beyond its reasonable control including without limitation, acts of God, fire, flood or other natural catastrophe, acts of any government in its sovereign capacity (including but not limited to any rule, law, order, regulation or direction thereof, or of any department, agency or commission thereof), national emergencies, insurrections, riots, war or hostile activities, quarantine restrictions, embargoes, launch failures, strikes, lockouts, work stoppages or other labor difficulties and sun eclipse or solar outages; provided, that notice thereof is given to the other Party within thirty (30) days of the later to occur of such event and the date that the Party being affected by such event obtains actual knowledge of such event.

16.12 **Further Assurances.** Each Party shall do and execute, or arrange for the doing and executing of, each necessary act, document and thing to implement this Agreement.

16.13 **Variations in Pronouns.** All pronouns and any variations thereof refer to the masculine, feminine or neuter, singular or plural, as the context may require.

16.14 **Headings, References.** The headings in this Agreement are for reference only, and shall not affect the interpretation of this Agreement. All references herein to Sections, subsections, clauses, Exhibits, and Schedules shall be deemed references to such parts of this Agreement, unless the context shall otherwise require.

16.15 **Exhibits and Schedules.** The following Exhibits and Schedules are attached to this Agreement and incorporated herein:

Exhibit A	Description of E-Cat IP, including Licensed Patents
Exhibit B	AEG Agreement
Exhibit C	Description of the the 1 MW E-CAT Unit and the "Hot Cat" Unit
Exhibit D	List of agreements related to E-Cat IP or E-Cat Products
Schedule 3.2(b)	Procedures for validation of E-Cat IP

IN WITNESS WHEREOF, the Parties hereto intending to be legally bound hereby, have duly executed this License Agreement on the date first above written.

INDUSTRIAL HEAT, LLC

By: Thos F. Darden

Name: THOMAS F DARDEN
Title: MANAGER
Address for Notices:
111 East Hargett Street, Ste 300
Raleigh, NC 27601
Email:

LEONARDO CORPORATION

By: A. Rossi

Name: ANDREA ROSSI
Title: PRESIDENT
Address for Notices:
Andrea Rossi
1331 Lincoln RD., APT 601
Miami Beach FL 33139
Email: eon333@libero.it

ROSSI

A. Rossi

Andrea Rossi ANDREA ROSSI
Address for Notices:
1331 Lincoln RD., APT 601
Miami Beach FL 33139
Email: eon333@libero.it

KN

AEG:

AmpEnergo, Inc.

By: Karl Naumann

Name: Karl Naumann
Title: member
Address for Notices:
4110 Sunset Boulevard
Steubenville, Ohio 43952
Email: crgcassarino67@gmail.com

EXHIBIT A

Description of E-Cat IP, including Licensed Patents

See attached.

EXHIBIT A

Description of the IP:

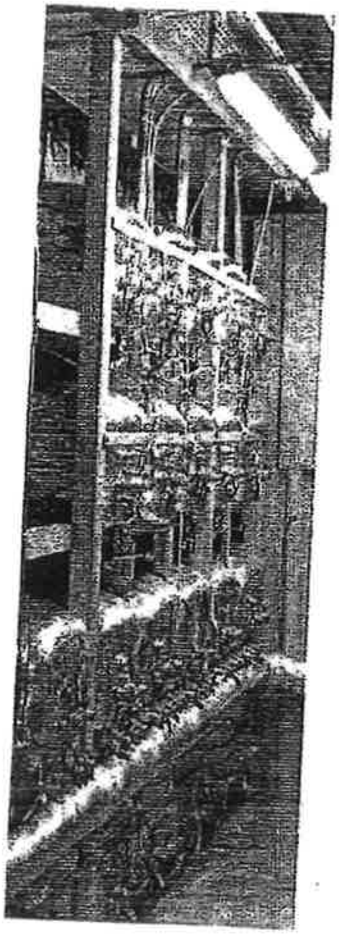
The IP is constituted by a volume in which are explained all the constructive drawings, with the dimensions and the characteristics of the materials, along with the instructions necessary to:

1- Manufacture the E-Cats
2- Operate the E-Cats
3- Manufacture the control systems
4- Operate the control systems

The IP will also contain 9 patents: (the "Licensed Patents")

1- Italian patent granted for process and apparatus
2- USA patent pending for process and apparatus
3- Europe patent pending for process and apparatus
4- USA patent pending for particulars and theory
5- USA patent pending for control systems
6- USA patent pending for additives and catalyzers in process and apparatus
7- USA patent pending for Hot Cat
8- USA patent pending for direct conversion of photons into electric energy
9- USA patent pending for particulars of the reactor

Specification of E-Cat 1Mw Unit



Thermal Output Power	1 MW
Electrical Input Power Peak	200 kW
Electrical input Power Average	167 kW
COP	6
Power Ranges	20 kW-1 MW
Modules	52
Power per Module	20kW
Water Pump brand	
Water Pump Pressure	4 Bar
Water Pump Capacity	1500 kg/hr
Water Pump Ranges	30-1500 kg/hr
Water Input Temperature	4-85 C
Water Output Temperature	85-120 C
Control Box Brand	Natl. Instr.
Controlling Software	Leonardo
Operation and MaintenanceCost	$0.5/MWhr
FuelCost	$0.1/MWhr
RechargeCost	$10/module
RechargeFrequency	2/year
Warranty	2 years
EstimatedLifespan	20 years
Price	1.5 M US
Total Cost (20 years operation)	12.13/MWh Euro
Dimension	2.4x2.6x6m

EXHIBIT D

List of Agreements Related to E-Cat IP or E-Cat Products

See attached.

EXHIBIT D

LIST OF THE EXCLUSIVE COMMERCIAL LICENSEES

1- AMPENERGO - AMERICAS
2- HYDROFUSION (LONDON): NORTH EUROPE
3- ECOGLOBALFUELS (SIDNEY): AUSTRALASIA, AFRICA,INDIA
4- LUBERONENERGIES (AMSTERDAM): FRANCE, BENELUX
5- LEONARDO SLOVENIA (LUBIANA): SLOVENIA
6- PROMETEON (BOLOGNA): ITALY AND AUSTRIA
7- ECAT DEUTSCHLAND (BERLIN) : GERMANY
8- ECAT SWISSE (ZURICH): SWISSE AND LIECHTENSTEIN
9- CASTIGAN (LA VALLETTA): MALTA
10- STREMMENOS (ATHENS): GREECE AND BALKANS
11- MAIMARIS (CYPRUS): CYPRUS

SCHEDULE 3.2(b)

Procedures for Validation of E-Cat IP

No later than five days following Validation of the Plant, Leonardo and Rossi will deliver to any combination of one or more United States patent attorneys (the "Attorney(s)") and a nuclear engineer (the "Engineer"), in each case that are not an Affiliate of Rossi, to be selected by Leonardo (the "Validation Agent"), all documents, manuals, technical data, formulae, and other items and materials (collectively, the "Technical Information") necessary or useful to enable the Company to (i) operate the IMW E-Cat Unit and the "Hot Cat," (ii) make E-Cat Products, and (iii) exploit the E-Cat IP as contemplated by this Agreement; provided, however, that the Technical Information shall not include the catalyzer formula used to fuel the E-Cat and the "Hot Cat" (the "Catalyzer Formula").

The Engineer will be engaged to review the Technical Information delivered to it and verify to the Company in writing that such Technical Information includes all items and materials that appear to be reasonably necessary or useful to enable the Company to build and operate the IMW E-Cat Unit and the "Hot Cat," exclusive of the Catalyzer Formula. The Engineer will be required to submit the written verification to the Company, Leonardo, and the Escrow Agent as soon as possible following Validation, but in any event within thirty days following Validation. The Escrow Agent will be instructed to deliver to Leonardo the escrowed $10,000,000 immediately upon receipt of the written verification from the Engineer.

Prior to delivery of the Technical Information to the Attorney(s) and the Engineer, if requested by Leonardo, such Attorney(s) and Engineer will be required to enter into an agreement pursuant to which they agree to keep the Technical Information delivered to them and the E-Cat IP in strict confidence and not disclose to any party any of the Technical Information or the E-Cat IP or the fact that they received and reviewed any of the Technical Information. Each Attorney and the Engineer will further agree to hold such materials in escrow and deliver the Technical Information in their possession (i) to the Company immediately upon receipt of notice from the Escrow Agent that the $10,000,000 has been delivered to Leonardo by the escrow agent as contemplated by Section 3.2(b), or (ii) to Leonardo in the event the Engineer is unable to verify that the Technical Information delivered to it meets the conditions specified above within thirty days following Validation. The Company shall bear the costs of the Engineer.

Leonardo and Rossi shall deliver the Catalyzer Formula to the Company immediately following delivery of the $10,000,000 to Leonardo by the Escrow Agent and shall concurrently advise, instruct and demonstrate to the Company the steps and procedures necessary to create the Catalyzer Formula and to use the Catalyzer Formula to make the IMW E-Cat Unit and the "Hot Cat" fully operable in the same manner as required for Validation of the Plant.

The Engineer's written verification, all Technical Information, the Catalyzer Formula, and all other E-Cat IP, to be delivered to the Company pursuant to the terms of the Agreement and this Schedule 3.2(b) must be in English.

COMPLIANCE WITH OFAC

JM Chemical Products, Inc. ("JMC")

~~JM Chemicals, Inc. ("JMC")~~ hereby represents and warrants to Industrial Heat, LLC ("IH") that the following representations are true and correct as of the date hereof and agrees to immediately notify IH if any of the following representations cease to be true and correct:

JMC and its subsidiaries, and their respective directors, officers, agents, employees and affiliates, are in compliance with the requirements of Executive Order No. 13224, dated September 23, 2001, and other similar requirements contained in the rules and regulations of the Office of Foreign Asset Control, Department of the Treasury ("OFAC") and in any enabling legislation or other executive Orders in respect thereof (the "Orders").

Neither JMC nor any of its subsidiaries nor any director, officer, agent , employee, affiliate or any person acting on behalf of JMC or any of its subsidiaries or affiliates, is, or is directly or indirectly owned or controlled by, an individual or entity that is currently subject to any sanctions administered by OFAC, or listed on the Specially Designated Nationals and Blocked Persons List maintained by OFAC on its official website pursuant to the Orders or on any other list of terrorists or terrorist organizations maintained pursuant to any of the rules and regulations of OFAC or pursuant to any other applicable Orders, or is a person who has been determined by competent authority to be subject to the prohibitions contained in the Orders, or is owned or controlled by, or acts for or on behalf of, any person on such lists or any other person who has been determined by competent authority to be subject to the prohibitions contained in the Orders.

JMC is owned by an entity formed in the United Kingdom, and none of Leonardo, Dr. Andrea Rossi, Henry W. Johnson nor any of their respective subsidiaries, directors, officers, agents, employees, affiliates, significant others, or relatives by blood or marriage has any ownership interest in JMC.

JM Chemical Products, Inc.

~~JMC CHEMICALS, INC.~~

By:

Name: Henry W Johnson

Title: President

FIRST AMENDMENT TO LICENSE AGREEMENT

THIS FIRST AMENDMENT TO LICENSE AGREEMENT (this "**Amendment**"), is made and entered into as of April 29, 2013 by and among LEONARDO CORPORATION, a New Hampshire Corporation ("**Leonardo**"), ANDREA ROSSI ("**Rossi**"), AMPENERGO, INC., an Ohio corporation ("**AEG**"), and INDUSTRIAL HEAT, LLC, a Delaware limited liability company (the "**Company**"). Each of Leonardo, Rossi, AEG and the Company are referred to herein as a "**Party**" and collectively as the "**Parties.**"

WHEREAS, the Parties entered into that certain License Agreement effective as of October 26, 2012 (the "Agreement"), and desire to amend the Agreement in certain respects. Capitalized terms used herein without definition have the respective meanings set forth in the Agreement.

NOW THEREFORE, in consideration of the mutual covenants and agreements set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

1. **Amendment**. The Agreement is hereby amended as follows:

A. Section 3.2(a) of the Agreement is hereby amended to delete the fourth sentence in its entirety and replace it with the following:

"The Plant will be available for Validation and delivery on April 30, 2013 (unless otherwise agreed in writing by the Company and Leonardo) and will be delivered to the location specified by the Company, at Leonardo's expense, within thirty Business Days following Validation."

B. Section 4 of the Agreement is hereby amended to delete the second and third sentences of Section 4 in their entirety and to replace them with the following:

"The Validation will be made in the factory of Leonardo in Ferrara, Italy on April 30th and May 1st 2013 (unless otherwise agreed in writing by the Company and Leonardo)." "Validation" will be deemed successful and achieved when the expert responsible for such validation ("ERV") certifies that the performance standards for the Plant set forth in <u>Exhibit A</u> to this Amendment have been met.

C. Section 16.7 of the Agreement is hereby amended to delete it in its entirety and replace it with the following:

16.7 **Assignment.** Other than the Company's right to sublicense as provided in Section 1, neither Leonardo nor Rossi, nor the Company, shall assign or otherwise transfer any of its rights, or delegate or otherwise transfer any of its obligations or performance under this Agreement, in each case whether voluntarily, involuntarily, by operation of law or otherwise, without the other party's prior written consent; provided that all Parties hereby consent to the assignment and transfer of this Agreement to one or more subsidiaries of the Company that are directly or indirectly wholly-owned by the Company. No delegation or other transfer will relieve

Rossi

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EXHIBIT C

Leonardo or Rossi or the Company of any of their obligations or performance under this Agreement. Any purported assignment, delegation or transfer in violation of this Section 16.7 is void. This Agreement is binding upon and inures to the benefit of the Parties and their respective permitted successors and assigns.

2. **No Other Changes.** Except as expressly provided herein, the Agreement remains in full force and effect and is ratified and confirmed by the parties to this Amendment.

3. **Counterparts.** This Amendment may be executed in counterparts, no one of which need contain the original signatures of all Parties, provided that one or more counterparts collectively shall contain the signatures of all Parties to this Amendment. Execution hereof by facsimile shall have the same force and effect as execution by original signature.

IN WITNESS WHEREOF, the Parties hereto intending to be legally bound hereby, have duly executed this License Agreement on the date first above written.

[Signature page follows]

KW

[Signature page to First Amendment to License Agreement]

INDUSTRIAL HEAT, LLC

By: ______________________
Name: Thomas F. Darden
Title: Manager
Address for Notices:
111 East Hargett Street, Suite 300
Raleigh, NC 27601
Email:

LEONARDO CORPORATION

By: ______________________
Name: ROSSI ANDREA
Title: CEO AND PRESIDENT
Address for Notices:
Andrea Rossi
1331 Lincoln Rd., Apt. 601
Miami Beach, FL 33139
Email: con333@libero.it

ROSSI

____
Andrea Rossi
Address for Notices:
1331 Lincoln Rd., Apt. 601
Miami Beach, FL 33139
Email: con333@libero.it

AEG:

AmpEnergo, Inc.

By: ______________________
Name: Karl Norwood
Title: President
Address for Notices:
4110 Sunset Boulevard
Steubenville, Ohio 43952
Email: crgcassarino67@gmail.com

Rossi 002390

Exhibit A

E-Cat Validation Protocol

Description: Two separate units ("Unit A" and "Unit B"), each composed of a different set of 30 individual E-Cat reactors, will be tested for a period of 24 hours, per the schedule below. Subsequently, a Hot Cat unit will be tested for a period of 15 hours, as described below. For purposes concerning validation achievement, only the performance of Unit A will be considered. Unit B and the Hot Cat are being tested solely for purposes of further research and development.

Location: Factory of Leonardo Corporation, Ferrara, Italy

Schedule:

Unit A will be tested 9:00 a.m. April 30th - 9:00 a.m. May 1st
Unit B will be tested 5:00 p.m. May 1st - 5:00 p.m. May 2nd
The Hot Cat unit will be tested 6:00 p.m. May 2nd - 9:00 a.m. May 3rd
The time of consideration will be the local time in Ferrara, Italy.

Unit A performance requirements: Unit A will be required to consistently produce energy that is at least six times greater than the energy it consumes (that is, a coefficient of performance "COP" of six or greater) and steam that is consistently 100 degrees Celsius or greater during a 24 hour test period.

Unit A test requirements: Prior to the test, the expert responsible for validation ("ERV") must provide Industrial Heat: 1) a list, including make, model and calibration, of all instruments used during the test; and 2) a detailed test protocol which describes, among other things, how the ERV will extract measurements and where he will place thermometers, manometers, flow meters and other such measuring instruments used during the test.

Activation and deactivation of the unit will occur before and after the 24-hour test period. Measurements outside the 24-hour test period will not be included for purposes of calculating the COP. The COP will be calculated as the ratio between generated energy and absorbed energy during the 24-hour period. In the event the individual reactors produce differing COPs, an average COP will be calculated and used for purposes of determining the COP.

The ERV will measure the flow of the heated fluid and the Delta T between the temperature of the fluid before and after the E-Cat reaction. The energy absorbed by the unit will be determined by measuring the electricity consumed. From these measurements, the ERV will determine the COP of the unit.

At the conclusion of the test, the ERV will produce a final report showing the results.

KW

TH

SECOND AMENDMENT TO LICENSE AGREEMENT

THIS SECOND AMENDMENT TO LICENSE AGREEMENT (this "**Amendment**"), is made and entered into as of October ______, 2013 by and among LEONARDO CORPORATION, a New Hampshire Corporation ("**Leonardo**"), ANDREA ROSSI ("**Rossi**"), AMPENERGO, INC., an Ohio corporation ("**AEG**"), and INDUSTRIAL HEAT, LLC, a Delaware limited liability company (the "**Company**"). Each of Leonardo, Rossi, AEG and the Company are referred to herein as a "**Party**" and collectively as the "**Parties**."

WHEREAS, the Parties entered into that certain License Agreement effective as of October 26, 2012, as amended by that certain First Amendment to License Agreement entered into as of April 29, 2013 (as amended, the "Agreement"), and desire to amend the Agreement in certain respects. Capitalized terms used herein without definition have the respective meanings set forth in the Agreement.

NOW THEREFORE, in consideration of the mutual covenants and agreements set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

1. **Amendment**. Section 5 of the Agreement is hereby amended to delete it in its entirety and replace it with the following:

   5. Guaranteed Performance.

   Payment of the amount set forth in Section 3(c) above is contingent upon a six cylinder Hot Cat unit reasonably acceptable to the Company (the "Six Cylinder Unit") operating at the same level (or better) at which Validation was achieved for a period of 350 days (even if not consecutive) within a 400 day period commencing on the date agreed to in writing between the Parties ("Guaranteed Performance"). Each of Leonardo and Rossi will use their commercially reasonable best efforts to cause Guaranteed Performance to be achieved, including making repairs, adjustments and alterations to the Six Cylinder Unit as needed to achieve Guaranteed Performance. The ERV (or another party acceptable to the Company and Leonardo) will be engaged to confirm in writing the Guaranteed Performance. Guaranteed Performance will not be deemed achieved unless such written confirmation is received or waived by the Company. In the event Guaranteed Performance is not achieved within the time period set forth in this Section (as such time period may be extended by the Company in its sole discretion), but the ERV confirms that during such time period the Six Cylinder Unit consistently produced energy that is more than 2.6 times greater than the energy consumed by the Six Cylinder Unit and that the temperature of the steam produced by the Six Cylinder Unit was consistently 100 degrees Celsius or greater, then the amount payable by the Company pursuant to Section 3(c) above shall be reduced proportionally (based on a percentage rounded to two decimal places) to account for the reduction in the Energy Multiple (which shall be rounded to the nearest tenth), with the Energy Multiple of 6 (or greater) resulting in payment of 100% of the amount payable pursuant to Section 3(c) and the production of energy that is 2.6 (or less) times greater than the energy consumed by the Six Cylinder Unit resulting in zero being payable pursuant to Section 3(c), with the total purchase price

EXHIBIT
"D"

set forth in Section 3.1 to be reduced accordingly. If neither the foregoing standard nor Guaranteed Performance is achieved, the Company shall not be required to pay any amount pursuant to Section 3(c) above and the total purchase price set forth in Section 3.1 shall be reduced accordingly.

2. **No Other Changes**. Except as expressly provided herein, the Agreement remains in full force and effect and is ratified and confirmed by the parties to this Amendment.

3. **Counterparts**. This Amendment may be executed in counterparts, no one of which need contain the original signatures of all Parties, provided that one or more counterparts collectively shall contain the signatures of all Parties to this Amendment. Execution hereof by facsimile shall have the same force and effect as execution by original signature.

IN WITNESS WHEREOF, the Parties hereto intending to be legally bound hereby, have duly executed this Second Amendment to License Agreement on the date first above written.

[Signature page follows]

[Signature page to Second Amendment to License Agreement]

INDUSTRIAL HEAT, LLC

By:
Name: Thomas F. Darden
Title: Manager
Address for Notices:
111 East Hargett Street, Suite 300
Raleigh, NC 27601
Email:

LEONARDO CORPORATION

By:
Name:
Title:
Address for Notices:
Andrea Rossi
1331 Lincoln Rd., Apt. 601
Miami Beach, FL 33139
Email: eon333@libero.it

ROSSI

Andrea Rossi
Address for Notices:
1331 Lincoln Rd., Apt. 601
Miami Beach, FL 33139
Email: eon333@libero.it

AEG:

AmpEnergo, Inc.

By:
Name:
Title:
Address for Notices:
4110 Sunset Boulevard
Steubenville, Ohio 43952
Email: crgcassarino67@gmail.com

From: JT Vaughn <jvaughn@industrialheat.co>
Sent: Wednesday, April 24, 2013 11:40 AM
To: Watkins, Thomas; Cain, Mark
Subject: Fwd: Test process

---------- Forwarded message ----------
From: **eon333@libero.it** <eon333@libero.it>
Date: Wed, Apr 24, 2013 at 3:45 AM
Subject: R: Test process
To: tdarden@industrialheat.co
Cc: JT Vaughn <jvaughn@industrialheat.co>, John Mazzarino <jmazzarino@industrialheat.co>

Dear Tom,
Please find in capital letters my answers along your text:

>----Messaggio originale----
>Da: tdarden@industrialheat.co
>Data: 24/04/2013 6.18
>A: "Dr. Andrea Rossi"<eon333@libero.it>
>Cc: "JT Vaughn"<jvaughn@industrialheat.co>, "John Mazzarino" <jmazzarino@industrialheat.co>
>Ogg: Test process
>
>Andrea:
>
>I have some thoughts about the test and some ideas an how we could improve its significance or meaning to the outside world, such as investors and potential customers. In other words, these ideas would improve our credibility with outsiders. I do agree with you that the prior test with the professors is important, probably more so than our test, and also that operating only a portion of the plant is not technically or theoretically any different than operating the whole plant.
OK
>
>Here are my thoughts. First, as we indicated, we can accept Fabio Penon as the ERV, instead of BV. We also can make our payment based on his report of the results from only a portion of the reactors, eg 20% or 25%. Said another way, we will agree to do a test of only those reactors constituting the allowable percentage of the plant (eg 35kw/210kw instead of 165kw/1mw). We would like to get details about how this will work: how many reactors, how will you decide which ones, etc?
VERY GOOD: WE WILL OPERATE 30 REACTORS, NO PREFERENCE ABOUT WHICH
>
>In order to improve the credibility of the test with outsiders, we would like

to do something else. We have two problems with the current situation, when we
compare it to what we thought was going to happen and what we represented to
others. First, the ERV is an individual instead of a large company, and second,
the test is of only a portion of 1mw.
>
>I would like to add someone else to the testing team, from one of the big
testing companies (if we can get them--we are calling them now). We have
spoken to SGS and will speak soon to BV and TUV. They say they might be able
to furnish someone who will observe the test and offer an opinion about it.
THIS CREATES A BIG PROBLEM, BECAUSE IN CASE OF DISAGREEMENT WE CAN HAVE
TROUBLES. YOU HAVE SEEN THAT PENON IS A CERTIFIED PROFESSIONAL, AND ALL HE HAS
TO DO IS TO MEASURE A FLOW, AN ELECTRICITY CONSUME, A TEMPERATURE, WITH
CERTIFIED INSTRUMENTATION. ANOTHER GUY WE DO NOT KNOW POSES MANY PROBLEMS,
AND
I EXPLAINED THEM IN MY FIRST EMAIL ABOUT THIS ISSUE; FOR EXAMPLE, HE COULD ASK
TO LOOK AT PARTICULARS WE DEEM INDUSTRIAL SECRETS, AT THAT POINT WHAT
HAPPENS?
WE TRUST IN PENON BECAUSE HE ALREADY PARTICIPATED TO INDIPENDENT TESTS ,
>
>We are not doing this for purposes of deciding whether to pay--that will be
decided by Penon, the ERV. But we want a report from one of these companies
that we can use to give to customers or investors. So, we want to have someone
at the test, for this reason.
I CAN ONLY REPEAT WHAT I WROTE ALREADY IN MY FORMER EMAILS AND HERE ABOVE.
>
>Second, we would like to run a test of another 200kw of the plant, maybe the
next day or the day before the Penon test. Can we test another set of about 25
reactors, the day before our Penon test or the day after? If we tested 40% of
1 mw, and If we did thIs in two tests with two different testing entities
(Penon and SGS, for example), that would be highly credible.
THIS IS NOT A PROBLEM. WE CAN MAKE 24 HOURS WITH A SET OF REACTORS AND OTHER
24 HOURS WITH ANOTHER SET
>
>So, we would like to consider having someone there from one of the big
companies (TUV, BV or SGS)
and we would like to test another 20% of the unit for a second day, either
before or after the day of the Penon test.
SO, TO MAKE A DOUBLE TEST WITH 2 DIFFERENT SERIES OF REACTORS IS NOT A
PROBLEM, AS FOR THE OTHER ISSUE , AS I SAID, YOU HAVE AT YOUR DISPOSITION THE
REPORT OF THE THIRD INDIPENDENT PARTY WHICH WILL BECOME OFFICIAL WITHIN A
COUPLE OF DAYS.
WARMEST REGARDS,
ANDREA
>
>Please offer your thoughts about these ideas.
>
>Thanks very much.
>Tom Darden
>Industrial Heat
>919 522 4095 m

>tdarden@industrialheat.co

--
JT Vaughn
Industrial Heat
919-649-5299
jvaughn@industrialheat.co