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# FAILURE ANALYSIS REPORT

*Doucet*
*14-hclbp-1douc*

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*May 12, 2014*

Date: May 12, 2014

Attention: W. Ransom Pipes
Hannah, Colvin & Pipes, L.L.P.
10626 Timberlake Drive
Baton Rouge, Louisiana 70810

Project: David Doucet, et al v. Dormont Mfg.
Claim: 821-4305
Our File: 14-hclbp-1douc
Inspection: 03/13/2014

*REFERENCES - PUBLICATIONS*


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2. 1334 Test Protocol T01-1 11Feb13
3. 1334 Test Protocol T02-1 11Feb13
4. Dormont 000001 – 000005

5. Defendant Dormont Manufacturing Company's Answers and Objections to Plaintiffs' Interrogatories.
6. Photos 4-02 through 4-09
7. Angus Michael Deposition

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1. "FlexTube Behind every challenge lies a solution" OEMCat, Rev. 0, 10-08, www.dormont.com, retrieved 03/13/2014.

*REFERENCES – OTHER*

1. Photos taken in the course of this investigation.
2. Exhibits as referenced in the report, if not otherwise noted.
3. Curriculum Vita and Expert Witness List of Marcus O. Durham, PhD, ThD, and Robert A. Durham, PhD.
4. Rate Schedule of Theway Labs.

*INITIAL REPORT*

At the request of W. Ransom Pipes, Esq., a laboratory inspection and analysis was made concerning an incident related to a Dormont Gas Range & Furnace Connector. An exemplar connector was provided.

Following the scientific method of NFPA 921, a laboratory examination was conducted. From my inspections, review of the documents, education, and experience, my observations and opinions include the following based on the information available at this time.

1. Based on information provided, an electrical fault occurred between an appliance connector and range. The fault created a perforation in the appliance connector. The hole allowed gas to escape, which was ignited by the electrical fault.
2. An exemplar appliance connector was investigated and tested in our laboratory to determine the probability for failure from electrical-magnetic energy.
3. The following sets forth the systematic approach I took in my investigation.

4. RECOGNIZE THE NEED.
    a. I recognized the need when I was retained to determine the potential for failure of the appliance connector due to electrical-magnetic energy.

5. DEFINE THE PROBLEM.
    a. There was a fire to a structure associated with an appliance connector. A thorough scientific investigation was required to determine the electrical-magnetic influences.

6. DATA GATHERING
    a. I collected the data identified in the references.

7. ANALYZE THE DATA

   a. The tubing is corrugated stainless steel, nominal 5/8" OD and 1/2" ID, with a nominal wall thickness of 0.010". The material is austenitic grade 304.

   b. The end-fittings are permanently attached. The material has been brass in the past but is steel now.

   c. The connector has very similar characteristics to appliance connectors by Brasscraft and CSST gas pipe by Gastite, et. al.

   d. We have conducted extensive research on the performance of these products as noted in the references.

   e. I have observed repeated incidences associated with corrugated flexible tubing, which is what comprises the subject flexible gas appliance connector. I have co-authored several articles, which identify the problems and failures of corrugated flexible tubing. One article is titled "CSST Response to Lightning and Transients, A Technical Analysis."

   f. As reflected in this and other articles, there are several problems with the subject connector that make the connector prone to electrical damage.

   g. The properties of the subject connecter cause the connector to fail when exposed to electrical energy transients.

   h. As set forth in my articles, the electrical failure phenomenon applies to a class of products associated with corrugated flexible tubing, of which CSST is only one. The subject flexible gas appliance connector is another type of corrugated flexible tubing. The properties in the subject connector are the same as the properties of CSST with the addition of fittings on the end of the subject connector.

   i. The difference between the subject connector and CSST is the length of the tubing, the fittings, and jacketing. This difference has no effect on the likelihood of the tubing to fail. What does have an effect on the likelihood of the tubing to fail is the proximity of the tubing to a metallic path for electrical-magnetic energy transfer and the absence of bonding or diversion path.

   j. The catalog for FlexTube lists the product as corrugated stainless steel tubing (CSST). The corporate representative accepted the connector as flexible, stainless steel corrugated line.

   k. The corporate representative affirmed he was not aware of how a gas connector or CSST would respond to an electrical anomaly and the company has not researched, tested, or investigated to determine effects of electrical energy on the tubing. The company employs no degreed electrical engineers.

   l. The company is aware of patents for alternate designs which divert electrical energy from the tubing, but has done nothing to explore any alternative designs.

   m. The company has been put on notice of events of product failure due to electrical anomalies. There has been one lawsuit filed related to lightning.

   n. A detailed analysis of the failure mechanism is shown below.

8. DEVELOP HYPOTHESIS.

   a. Can electrical energy from a fault create a penetration in the corrugated tubing more easily than in alternative piping systems?

b. Can a hole in the tubing allow gas to escape and be ignited?

c. Are there warnings on the installation instructions declaring the dangers of arcing and faulting failures.

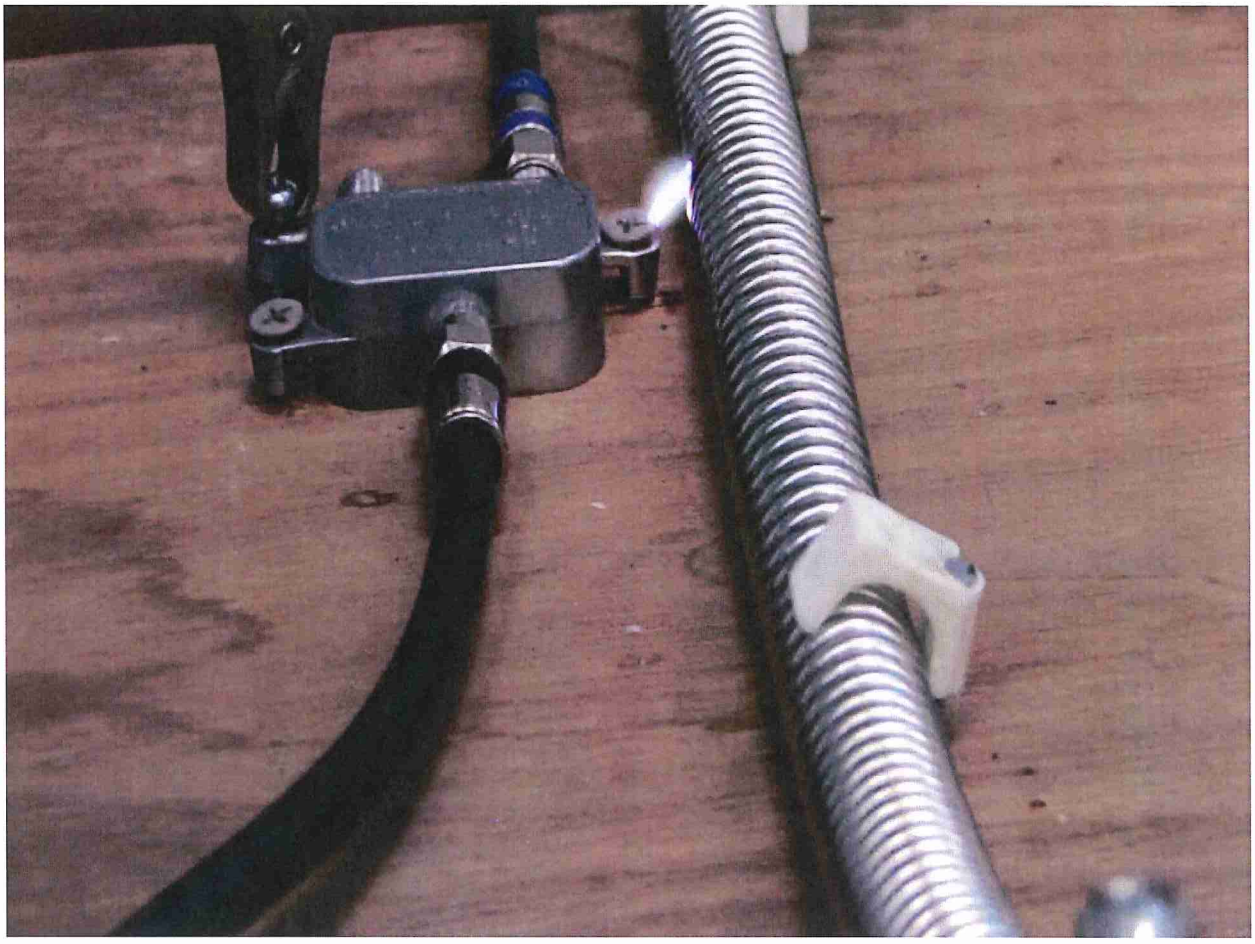
d. Are there warnings that the gas pipe must be separated from potential electrical energy transfer locations or must be adequately bonded to adjacent metal to prevent discharge across a poor connection and resultant damage from transients.

9. TEST HYPOTHESIS

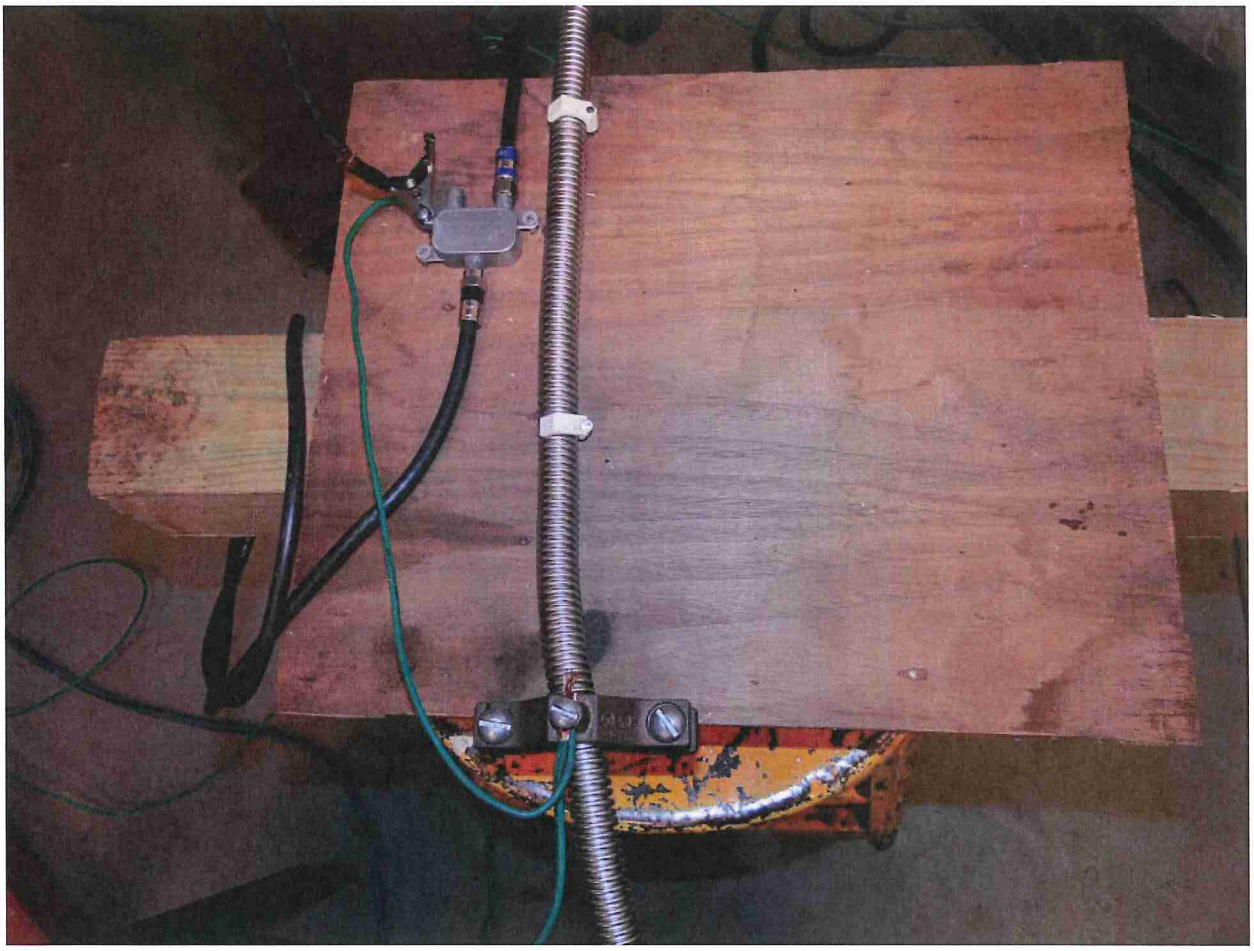
a. Testing the hypothesis can be performed analytically and by deductive reasoning pursuant to NFPA 921 articles 4.3.6 and 3.3.35.

b. In addition, experiments were conducted in our laboratory to illustrate the danger of inadequate bonding and failure due to pipe configuration.

c. For this investigation, the Dormant tubing was connected to our hi-voltage simulator. Like other corrugated stainless steel tubing products, arcing occurred to the pipe without touching the energized conductor, when the tubing was not bonded, as seen in the first photo.



d. Similarly, arcing did not occur when bonding was less than 10 feet, as seen in the second photo.



e. Calculations were performed related to comparative energy transfer between alternative pipes. Based upon previously published, peer review research, the amount of energy dissipated through a penetration in a metal surface can be calculated from the following formula:

$$q = Cm\Delta T_m + mH_f \quad (1)$$

where:

| | |
|---|---|
| q | Energy required to raise the material to melting point and then to actually melt the material |
| $C$ | Specific Heat of the material |
| $H_f$ | Heat of Fusion of the material |
| $\Delta T_m$ | Temperature change from the initial temperature to the melting point |
| $M$ | Mass of the material translated |

i. Mass can be calculated by combining the volume of the material that changes state (melts) and the density of the material (ρ).

ii. The properties of various pipe and tubing are well-known chemical properties and are shown in the table. All pipe and tubing is nominal ½-inch diameter to provide consistent correlations. Wall thickness is given in inches.

**Table 1 - Material Properties**

| MATERIAL | C BTU/LBM °F | $\Delta T_M$ °F | $H_F$ BTU/LBM | DENSITY LBM/IN$^3$ | WALL THICKNESS IN |
|---|---|---|---|---|---|
| CT | 0.12 | 2528 | 122.527 | 0.286 | 0.010 |
| DUCTILE IRON | 0.1 | 2678 | 122.7 | 0.284 | 0.109 |
| COPPER | 0.092 | 1909 | 91.1 | 0.324 | 0.04 |

iii. The amount of energy necessary to create a penetration can be calculated for various gas piping materials, including the corrugated tubing (CT) identified above. These values are shown in the table. As can be seen, it takes nearly 10 times as much energy to make the same size penetration in ductile iron pipe than in CT, and nearly 3 times as much energy to make the same size penetration in copper than in CT.

**Table 2 - Energy Necessary to Create Penetrations**

| Material | q (BTU) | q (Joule) |
|---|---|---|
| CT | 0.008170217 | 8.620035 |
| Ductile Iron | 0.081084726 | 85.54891 |
| Copper | 0.023187119 | 24.46371 |

iv. With the amount of energy known, the temperature rise of the black pipe for a similar size area can be examined. Based upon the above formula and data, the temperature rise of ductile iron (black) pipe would only be 323°F, or approximately 2500°F less than is necessary to raise the pipe to melting temperature, not taking into account the heat of fusion.

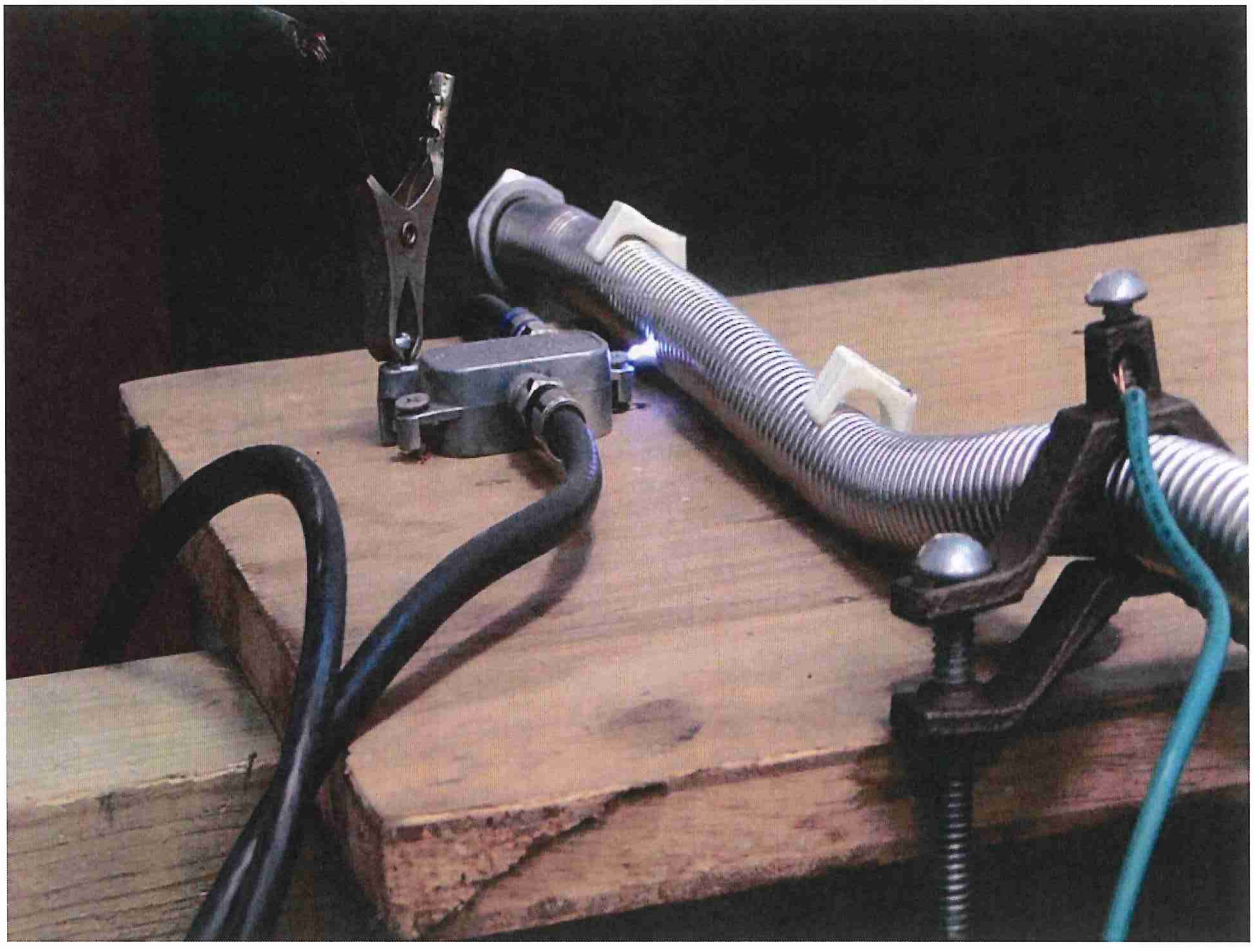
v. The 8.6 joules of energy used to create the penetration in corrugated tubing is in the range of penetrations that have been observed before, and for which published material exists.

f. Comparisons of the mechanical configuration were performed related to electric field and energy concentration.

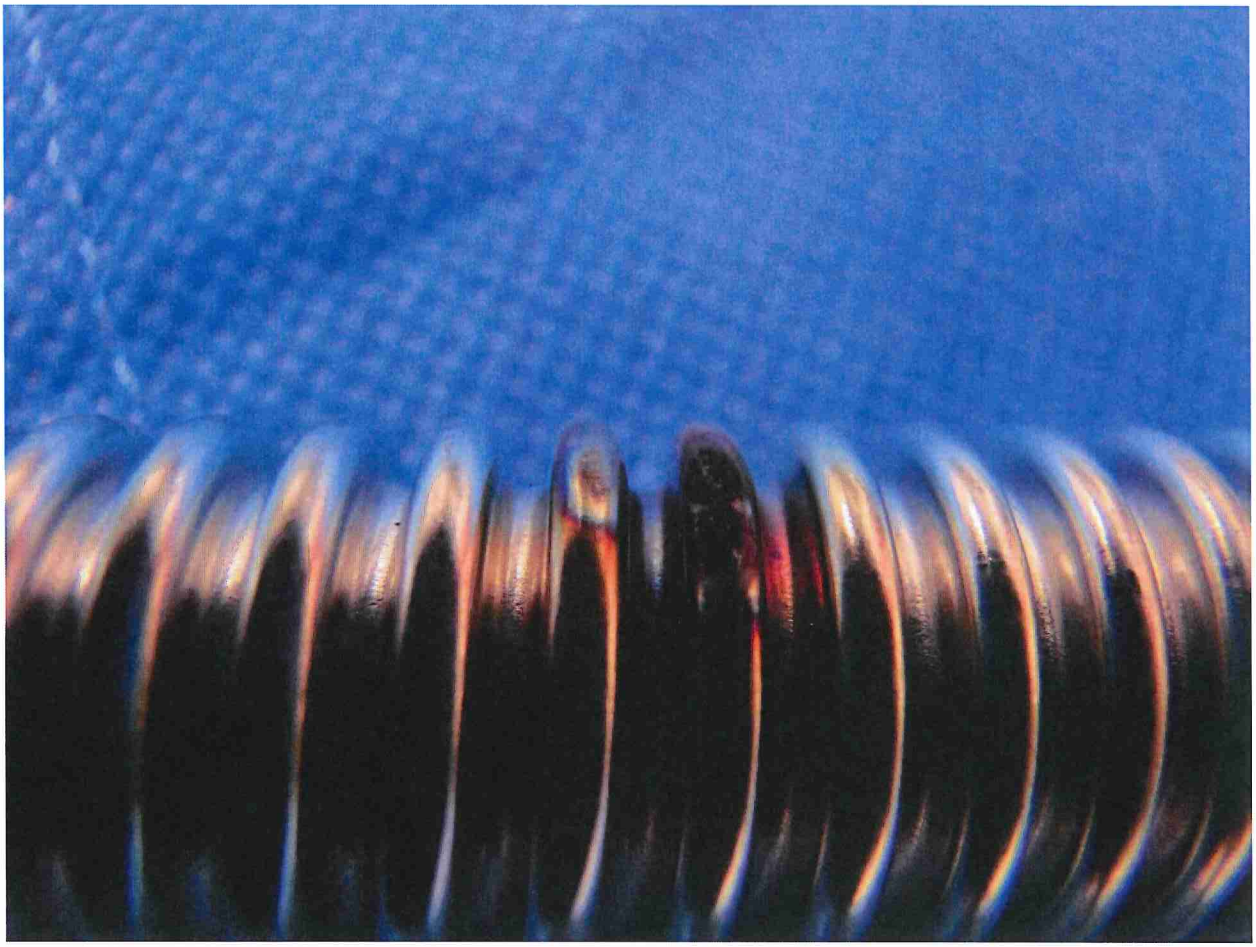
i. The corrugated tubing has high ridges which concentrate the electric field and the energy disbursed during a discharge.

ii. Cylindrical pipe disburses the energy over a much larger area distributing the discharge.

iii. The figure shows the electric discharge to the top of the ridge during the laboratory tests.



iv. A close-up shows the faulting occurs at the top of the ridge.



v. The area is related to the radius of curvature at the ridge versus the radius of curvature of the cylindrical pipe. The nominal external radius of the corrugated ridge is .04", while the nominal radius of 1/2" steel pipe is 0.42", which is greater than a factor of 10.

vi. The energy concentration is the inverse of the square of the radius. The inverse square for the tubing is 625, while the inverse square of the pipe is 5.67. The concentration on the tubing is 110 times greater..

vii. Therefore, cylindrical pipe will have 110 times less energy density discharge to the surface. Less energy density results in less likelihood of penetration failure.

g. The combination of less material thickness and more concentrated energy makes the probability of failure of corrugated tubing over a 1000 times greater than conventional pipe.

10. SELECT FINAL HYPOTHESES

a. Electrical discharge occurs when corrugated tubing is near components which are electrically energized.

b. Based on calculations shown, the corrugated tubing is penetrated by electrical energy much more easily than alternatives.

c. The product fails when exposed to adequate electrical-magnetic energy, including the energy from an electrical fault.

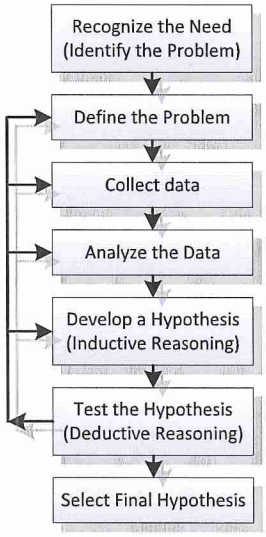
d. Penetration in pipe will allow gas to escape which can be ignited by electrical discharge.

e. There were no warnings on the installation instructions declaring the dangers of electrical arcing or faulting failures.

f. There was no warning that the gas pipe must be separated from potential electrical energy transfer locations or must be adequately bonded to adjacent metal to prevent discharge across a poor connection and resultant damage from transients.

11. The following additional data, analysis, and hypotheses provide support information to validate the process and science.

12. NFPA 921 is A *Guide for Fire and Explosion Investigations*. NFPA 921 recognizes the problems with electrical connections causing fires. NFPA 921 defines a version of the scientific method which was employed in this analysis. The steps of the scientific method as defined by NFPA 921 are defined in Article 4.3 and shown in the figure. Article 4.3 states "The scientific method is a principle of inquiry that forms a basis for legitimate scientific and engineering processes including fire incident investigation."




a. *Article 4.3.4 Analyze the Data* states:

*The scientific method requires that all data collected be analyzed. This is an essential step that must take place before the formation of the final hypothesis. The identification, gathering and cataloging of data does not equate to data analysis. Analysis of the data is based on the knowledge, training, experience, and expertise of the individual doing the analysis. If the investigator lacks expertise to properly attribute meaning to a piece of data, than assistance should be sought. Understanding the meaning of the data will enable the investigator to form hypotheses based on the evidence, rather than on speculation.*

b. *Article 4.3.5 Develop a Hypotheses* states:

*Based on the data analysis, the investigator produces a hypothesis or hypotheses to explain the phenomena…These hypotheses should be based solely on the empirical data that the investigator has collected through observation and then developed into explanations for the event, which are based upon the investigator's knowledge, training, experience and expertise.*

c. *Article 4.3.6 Test the Hypothesis* states:

*The investigator does not have a provable hypothesis unless it can stand the test of careful and serious challenge. Testing of the hypothesis is done by the principle of deductive reasoning, in which the investigator compares his or her hypothesis to all the known facts as well as the body of scientific knowledge associated with the phenomenon relevant to the specific incident…If the hypothesis cannot be supported, it should be discarded and alternate hypotheses should be developed and tested. This may include the collection of new data or the reanalysis of existing data. The testing process needs to be continued until all feasible hypotheses have been tested and one is determined to be uniquely consistent with the facts, and with the principles of*

*science. If no hypothesis can withstand an examination by deductive reasoning, the issue should be considered undetermined.*

d. *Article 4.3.7 Avoid Presumption* states:

*Until data have been collected, no specific hypothesis can be reasonably formed or tested. All investigation of fire and explosion incidents should be approached by the investigator without presumption as to origin, ignition sequence, cause, fire spread, or responsibility for the incident until the use of the scientific method has yielded a provable hypothesis.*

e. *Article 8.9.2.3 Poor Connections states:*

*When a circuit has a poor connection such as a loose screw at a terminal, increased resistance causes increased heating at the contact, which promotes formation of an oxide interface. The oxide conducts current and keeps the circuit functional, but the resistance of the oxide at that point is significantly greater than in the metals. A spot of heating develops at that oxide interface that can become hot enough to glow. If combustible materials are close enough to the hot spot, they can be ignited…*

f. *Article 8.9.6 High-Resistance Faults states:*

*Depending on the nature of the fault and the extent of the fire damage, evidence of a high resistance fault may be difficult to find after a fire. Examples of high resistance faults are an energized conduction coming into contact with a poorly grounded object, or a poor plug blade-to-receptacle connection.*

g. *Article 8.10.4 Overheating Connections states:*

*Connection points are the most likely place for overheating to occur on a circuit. The most likely cause of the overheating will be a loose connection or the presence of resistive oxides at the point of connection. Metals at an overheating connection will be more severely oxidized than similar metals with equivalent exposure to the fire…Heat can be transferred along conductors attached to the overheated connection, resulting in charring or loss of the conductor's insulation. The charring or loss of plastic insulation may allow arcing to occur. Such arc damage may survive the fire.*

13. *Electrical Failure Analysis for Fire & Incident Investigators* is a text describing electrical failures and the analysis thereof.

a. Section 2.3 describes electrical metal conditions post-fire:

*i. The three conditions for electrical fire relation are energized generative, energized result, and de-energized.*

*1. Energized generative includes electrical items that are the reason for the failure or fire.*

*2. Energized result includes electrical items that are energized at the time of the fire, but the damage is due to encroaching heat from the incident.*

*3. Non-energized items cannot be an electrical cause of the failure or incident since there is no electrical energy.*

*ii. When the components are the cause of the fire, they are often destroyed by the intense energy at the location of the incident.*

b. Section 3.2 describes the causes of failure.

*i. There are three parties that may contribute to a failure – supply, product and user.*

1. *Supply is used to describe the electrical system up to the point that the user has some action such as turning on a switch or plugging in an appliance…The Why of a supply failure is a result of problems with the installation, operation or maintenance.*
2. *Product is used to describe equipment and items whether on the supply side or the user side. The Why of a product failure is a result of defects in design, manufacturing, or distribution.*
3. *User describes the person that employs the product and the supply…Why the user can cause a failure is through misuse, abuse or neglect.*

c. Section 5.2 describes common risks associated with devices.

i. *Economics trade-off: The classic engineering trade-off is between cost, time, and quality. Economics plays an important component in any appliance. The less expensive appliances by definition are constructed more cheaply. There is a trade-off with safety. Although safe for general use, less expensive devices have a greater propensity for failure than a more expensively constructed device.*

d. Chapter 10 and other sections describe the risks associated with electrical-magnetic energy, transients, and the procedures which can be used to mitigate damage. Included in this analysis is a discussion of corrugated tubing.

e. Chapter 12 describes User Warnings.

i. *Warnings have three levels as noted by the **signal** words – caution, warning, and danger.*

ii. *Warning indicates a hazardous situation which, if not avoided, could result in death or serious injury.*

14. Based upon my education, training, experience, review of the documents, inspections, data, testing, previous publications and analysis, my opinions include the following to a reasonable degree of scientific certainty:

a. Corrugated tubing is a flexible, very thin wall material susceptible to failure when exposed to electrical-magnetic energy.

b. The high impedance connection between the corrugated tubing and the electrical energy allows a fault path for discharge and generation of heat.

c. Corrugated tubing is 1000 times (3 orders of magnitude) more prone to failure when exposed to electrical discharge than alternative piping systems.

d. Corrugated tubing is inherently dangerous when applied in a region with significant electrical-magnetic energy.

e. The articles are a reflection of my experience with transients, grounding, and corrugated tubing related failures. The referenced articles and others validate my opinions, since they are peer reviewed by other authorities in the field of failure analysis and fire investigation.

This is an initial report, based on information available at this time. I reserve the right to supplement as additional data is gathered. If you have any questions, please let me know.

Our curriculum vita and list of expert witness cases in the past four years are included as a part of this report.

Regards,

Marcus O. Durham, PhD, ThD
Sr. Principal

Life Fellow, American College of Forensic Examiners Int'l
Life Fellow, Institute of Electrical & Electronics Engineers
Life Sr. Member, Society of Petroleum Engineers
Diplomate, Am Board of Forensic Engineering &Tech
Licensed Electrical Contractor
Licensed Commercial Radiotelephone & Amateur Extra
Cert Fire & Explosion Inv. & Cert Vehicle Fire Inv. - NAFI I
Certified Homeland Security, ABCHS
Registered Investigator, ABRI
Member, Int'l Assoc of Arson Investigators-OK & Nat'l
Member, IEEE Standards Association
Voting Member, Nat'l Fire Protection Assoc – Electrical
Richard H. Kaufmann Medal – IAS / IEEE
Professor Emeritus, U of Tulsa

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Robert A Durham, PhD
Principal

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Member, IEEE Standards Association
Voting Member, Nat'l Fire Protection Assoc - Electrical
Member, American College of Forensic Examiners
Member, Int'l Assoc of Arson Investigators- OK
Member National Association of Fire Investigators
Cert Fire & Explosion Inv. & Cert Vehicle Fire Inv.
Certified Forensic Consultant
Licensed Electrical Contractor
Director, Am Board of Forensic Engineering & Tech

CRANE ENGINEERING

**David Doucet, et al**
**v.**
**Dormont Manufacturing Company**
**United States District Court**
**Middle District of Louisiana**
**Civil Action No.: 3.13-cv-00251**

| | |
|---|---|
| Your Client: | David Doucet |
| Date of Loss: | January 17, 2012 |
| Crane File No.: | A7916 |
| Crane Descriptor: | FIR – DORMONT – DOUCET |

Prepared for: Mr. H. Brook Laskey
McCoy Leavitt Laskey LLC

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Thomas R. Crane, P.E.
June 13, 2014
License No: 013315

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## *BACKGROUND*

Crane Engineering was contacted regarding the referenced matter by counsel for Dormont Manufacturing Company (Dormont) on December 20, 2012. Mr. Charles Keith, P.E., of Crane Engineering has conducted personal testing and examination of the retained artifacts in this matter. His conclusions and opinions are presented under separate cover. Crane Engineering has also reviewed testimonial and related information regarding the incident, a complete listing of which is included as addenda to this report.

### Incident Location Description

Review of this case information has included consideration of reports prepared by plaintiff's experts. Notably, the report presented by Marcus O. Durham presents information that compares the product which is the subject of this investigation a flexible connector for a gas appliance (also known as a gas appliance connector), to a gas piping material known as CSST.

## *ANALYSIS*

The natural gas utilization system in the Doucet residence was comprised of a piping system which conveyed the natural gas from the point of delivery to the location of the appliance. The gas appliance at issue in this matter is a Jenn-Air JD 8895 Freestanding Double Oven Dual Fuel Range gas and electric kitchen range. This is connected to the gas piping through the use of a Dormont gas appliance connector. The National Fuel Gas Code, NFPA 54/ANSI Z223.1 (2006 edition), Section 9.6.1, specifies that an appliance shall be connected to the building piping by one of several methodologies including the use of a listed connector designed and manufactured in compliance with ANSI Z21.24, Standard for Connectors for Gas Appliances.

### Appliance Connectors

Some gas appliances are installed in circumstances wherein they can be connected to the gas distribution piping of the residence directly with rigid metallic pipe and fittings or semi-metallic metal tubing with appropriate fittings. However, it is customary for certain appliances to be connected to the gas piping system through use of an appliance connector so as to allow and facilitate occasional movement for the purposes of servicing and cleaning. These requirements are common (but not restricted) to appliances such as cook stoves and dryers.

The need to establish recognized and accepted standards for appliance connectors for gas appliances was developed many years ago. The correct standard governing the design and manufacture of the subject Dormont appliance connector is ANSI Z21.24. The distinct description of this product is provided in the "Definitions" section of ANSI Z21.24 (2006):

> **CONNECTOR, GAS APPLIANCE.** A factory-fabricated assembly of gas conduit and related fittings designed to convey gaseous fuel, and used for making connections between a gas supply piping outlet and the gas inlet to an appliance. It is equipped at each end for attachment to standard taper pipe threads. A gas appliance connector is not for vibration isolation. Connectors for Gas Appliances, Z21.24 • CSA 6.10, are not designed for repeated movement after being connected nor for repeated disconnecting and connecting shall not be used with quick-disconnect devices. For installation requiring movement of the appliance on a regular basis, refer to the *Standard for Connectors for Movable Gas Appliances, ANSI Z21.69 • CSA 6.16*.

ANSI Z21.24 is an industry consensus standard whose origins go back nearly 80 years. The following historical summary section is excerpted from the 1967 edition of Z21.24:

> In April, 1928, the American Gas Association Approval Requirements Committee was asked to prepare a standard for semi-rigid tubing which would be consistent with the use of this type of conduit on accessories for gas appliances and for connecting gas appliances to housing piping.
>
> . . . the Subcommittee on Listing Requirements for Semi-Rigid Gas Appliance Tubing and Fittings was formed in May, 1932.
>
> This standard was approved by the American Standards Association on February 11, 1935.
>
> While semi-rigid tubing and fittings were used successfully in connecting flush-to-wall type gas ranges to house piping, it was believed that a more flexible type of connection would be advisable in order to permit moving an appliance into its final position after attachment to house piping. The subcommittee therefore prepared a draft standard for gas appliance connectors of flexible metal tubing and fittings. The draft standard, after review by the industry, was approved by Sectional Committee Z21 on October 22, 1941, as a proposed standard, and was adopted as American Standard by the American Standards Association on March 17, 1942.
>
> During the war years considerable standardization was done in the field of tubing manufacture and many new types of tubing fittings were developed to meet military needs. In view of the standardization of the tubing it did not appear that there was any longer a need for retaining specifications for tubing. Specialized designs of fittings appeared to preclude the possibility of attempting to cover all types in the standard. It seemed a more practical consideration to examine tubing and fittings in a completed gas appliance as they would be assembled by the appliance manufacturer. It therefore

> appeared that specifications for conduit type tubing and fittings could be abandoned and that this would allow greater consideration of the assembled connector, which was being widely used in the industry.
>
> This consolidated draft standard, following review by the industry, was approved by Sectional Committee Z21 on March 29, 1955, as a proposed standard. This, the first edition, was adopted as American Standard by the American Standards Association on November 28, 1955.

The ANSI Z21.24 standard proscribes the construction and performance of the gas connector. It is noted that the scope of Part 1, "Construction" requirements of the product includes instructions (Section 1.8) and marking (Section 1.9). The subject appliance connector in the Doucet residence was observed after the incident to have a label of information which complies with the Z21.24 requirements.

**Household Cooking Appliances**

It is a significant factor in the analysis of the subject incident that a gas utilization system of the type in the Doucet residence would be required to utilize a household cooking gas appliance that was listed and in conformance with the standard governing that product, ANSI Z21.1-2005. This is significant because to be in conformance with applicable codes the subject appliance connector would be used in a location where physical contact of materials or devices near the connector would be limited to the body or cabinet of the appliance and the surrounding wall or cabinetry material. A gas cooking appliance in conformance with the Z21.1 standard would not have exposed the gas appliance connector to a live electrical component. This requirement is specified in Section 1.27.9 of ANSI Z21.1-2005.

In contrast to the anticipated condition of the gas appliance as required by code, the gas range in the Doucet incident was observed to have electrically energized components which came in contact with the appliance connector and caused the resulting product perforation and subsequent fire.

**Electrical Grounding**

The Durham report indicates in Sections 10E and 10F that no warnings or installation instructions were provided regarding the dangers of electrical arcing and that there was no warning that the gas appliance connector must be separated from potential electrical energy transfer locations. The National Fuel Gas Code requires that components of the gas piping system be electrically continuous and bonded (as by the connection of one section of piping to the next) and that the system would be considered to be grounded as it is attached to an appliance which is electrically grounded, such as a household cooking appliance (ANSI Z223.1, Section 7.13). Further, the installation instructions for the Dormont connector specifically instruct the user to:

> AVOID contact of the connecter with foreign objects such as wall studs, electrical wiring, copper or iron pipe, paneling, sheet metal, etc. to avoid corrosion. **DO NOT** use the gas connector or gas supply line for the appliance ground.

It is also noted that the warnings advocated in the Durham report are not suggested or required by ANSI Z21.24, NFPA 54 (the National Fuel Gas Code), The International Fuel Gas Code, or the installation and product information of a competitive appliance connector manufacturer, BrassCraft®.

The Durham report also infers that other types of piping material, such as copper, would mitigate or prevent the subject incident. As per the National Fuel Gas Code (2006 edition, Section 9.6.1) semi-rigid metallic tubing, such as copper, can be used to connect an appliance to the gas piping system. In practice this is typically accomplished by incorporating a large loop of flexible copper tubing behind the appliance. In this application copper has a distinct disadvantage in comparison to an approved appliance connector in that copper will not reliably provide repeated flexibility as is the case with an appliance connector. Furthermore, if it were assumed that a loop of copper had been used to connect the gas appliance in the Doucet kitchen, it cannot be concluded that the same failure would not have occurred. I have personally observed copper gas tubing which has been perforated by contact with electrically energized conductors.

**CSST**

Plaintiff's expert Marcus Durham infers similarities between the subject product, a listed appliance connector, and the piping material, CSST. CSST is a gas piping system product which was developed relatively recently compared to appliance connectors. The current standard for CSST is ANSI LC1, Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing (CSST). The earliest edition of this standard was published in 1987 and was originally titled AGA 1-87, "AGA Requirements for Natural Gas Piping Systems Using Corrugated Stainless Steel Conduit". In 1991, the standard became ANSI LC1. The first edition of the National Fuel Gas Code to recognize and permit the use of CSST was the 1988 edition, adopted on July 15, 1988.

The LC1 standard describes the coverage of the product applicable within the scope of the standard in Section 1.1.1 (ANSI LC1-2005):

> This standard applies to natural and propane gas piping systems using corrugated stainless steel tubing (CSST), intended for installation in residential, commercial or industrial buildings, and including the following components as a minimum:
>
> a. Corrugated stainless steel tubing (CSST);
> b. Fittings for connection to the CSST; and
> c. Striker plates (see Part IV, Definitions) to protect the installed CSST from puncture threats.

The LC1 differentiates itself from gas appliance connectors in LC1 Section 1.1.8:

> This standard does not apply to gas connectors for appliances. These connectors are covered by Standards ANSI Z21.24 • CSA.6.10 and Z21.69 • CSA 6.16.

These two standards, LC1 for CSST and ANSI Z21.24, connectors for gas appliances, portray different products for different purposes. The corrugated tubing which is one element of a CSST system is intended to convey the fuel gas to different locations within a structure in a manner congruent with the LC1 standard and the National Fuel Gas Code. The lengths of tubing associated with CSST are not limited by the standard or the fuel gas code. A CSST system requires field installation of all components, including the end fittings, by qualified installers. In contrast, an appliance connector incorporates manufactured end fittings as a part of the manufactured product and its length is limited to a maximum of six feet. While CSST can be run through walls from space to space within a structure, the National Fuel Gas Code and ANSI Z21.24 prohibit the use of an appliance connector to be used for passing through either a wall or the cabinet of an appliance. The only acceptable location for an appliance connector is the same room as the connected appliance providing a method of connecting the gas piping system to the appliance. For reference, a tabulated history of the successive editions of ANSI Z21.24 and ANSI LC1 are included as addenda to this report.

## CONCLUSIONS AND OPINIONS

Based on my training, education and experience, and my review of materials related to the referenced matter (see addenda for complete materials listing), I hold the following opinions and conclusions to a reasonable degree of engineering certainty:

A. The Dormont product which connected the gas piping system at the Doucet residence to the kitchen gas/electric range was an appliance connector as described by ANSI Z21.24.

B. The subject Dormont product was not CSST and cannot be installed or manufactured under codes and standards related to CSST. Further, the performance and design cannot be compared to those for CSST.

C. The perforation induced in the appliance connector at the Doucet residence could only have occurred if the gas cooking appliance in the Doucet kitchen was in violation of ANSI Z21.1, the American National Standard for Household Cooking Appliances. Specifically, stated in converse, had this appliance been compliant with the applicable appliance standard there would have been no exposed and energized electrical components to have come in contact with the Dormont appliance connector. The presence of exposed and energized electrical components could only be possible if the appliance was not in compliance with ANSI Z21.1 when it was manufactured or it was modified subsequent to manufacture.

D. Appliance connectors manufactured in accordance with ANSI Z21.24 are products which provide significant utility in that they allow safe appliance connection via a flexible connector which will not be degraded through occasional movement of the connected appliance. The utility and safety of properly installed gas appliance connectors have been demonstrated by decades of use in installations throughout the country. There is nothing defective or inherently dangerous about the Dormont appliance connector in this incident.

The research, conclusions, and opinions presented herein are based on information available in this matter to date. Should additional information become available which bears upon the issues discussed herein this report will be supplemented as required. A listing of testimonial history for the last four years is included as addenda to this report. My services for work in this matter are billed by Crane Engineering at $325 per hour.

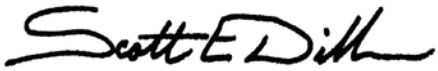
Respectfully submitted,

CRANE ENGINEERING, INC.

Thomas R. Crane, P.E.
President
*TomC@CraneEngineering.com*

Reviewed by,

I hereby certify that this report was reviewed by me and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



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TRC/deh

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**FINAL REPORT**

**2967-RPT-1**

# RESULTS AND OPINIONS DEVELOPED FROM EXAMINATIONS OF THE COMPONENTS ASSOCIATED WITH THE FIRE

**AT THE**

**DOUCET RESIDENCE**
**12254 FAIRLANE ROAD**
**ST. FRANCISVILLE, LA70775**

PREPARED FOR

Brook Laskey, Esq.
McCoy Leavitt Laskey LLC

Prepared by

Richard A. Hoffmann, P.E.
Hoffmann & Feige, Brewster, NY

June 10, 2014

## TABLE OF CONTENTS

## 1.0 LIMITATIONS

I have been retained by H. Brook Laskey, Esq., of McCoy Leavitt Laskey, LLC, on December 19, 2012.

The data, analyses, and conclusions contained in this report are based on my ongoing review of documents and other materials available to Hoffmann & Feige. Should additional information provide further insight, Hoffmann & Feige reserves the right to supplement this report.

The purpose of this investigation is to assist in a potential specific litigation. It is not intended for other purposes. The opinions expressed in this report are held to at least a reasonable degree of engineering certainty. Although Hoffmann & Feige has exercised usual and customary care in the conduct of this analysis, the responsibility for decisions regarding its use remains with H. Brook Laskey, Esq., of McCoy Leavitt Laskey, LLC.

This document presents my analysis and findings to date. As, if, and when investigations continue in this matter, I may render additional opinions based on my continuing review of relevant materials and testimony. I reserve the right to revise and augment my opinions as my work on this matter continues. Additionally, as discovery is ongoing, I reserve the right to supplement this report.

## 2.0 SUMMARY OF OPINIONS

These opinions are based on my findings developed through the course of the review of documents and through field and laboratory investigations.

1. The fire in the Doucet kitchen at 12254 Fairlane Rd., St. Francisville, Louisiana, was the result of ignition of the gas leaking at the perforations introduced to the Dormont connector which ran between the Jenn-air stove and the gas valve which was hard mounted to the wall behind the stove.

2. The “red” and the “green” perforations observed in this Dormont connector were caused by melting from electrical causes.

   *(The “red” and “green” perforation terms were used to identify the sequence in which the perforations were identified by others - the green perforation was identified as such based on the presence of the green plastic tape on the Dormont Connector and was in place by the Metairie investigation in February 13, 2013. The red perforation identification was identified as such because of the usage of a red marking pen to outline its location following its discovery during leak testing at MEEI on May 21, 2014.)*

3. It is my opinion that metal-to-metal contact took place between the right protruding lower oven heating electrode connector and the Dormont connector. This opinion is based on the visible evidence of local melting and the EDS analyses performed herein, which showed the presence of chromium on the right lower oven electrode connector which did not contain chromium. This chromium could only come from the Dormont connector.

4. The back side of the range is the only area where the electrical source was available to provide the energy to cause these two perforations in the same axial position on this Dormont connector.

5. The protective cover plate for the electrical contacts for the lower oven heating element electrodes was not available for examination, nor was it shown in any of the photographs examined. There was a screw hole in the bottom area of the protective steel sheet directly above the opening for the lower oven element electrical connectors on the back of the range that, in my opinion, was made for the attachment of this protective cover plate.

6. The “red” perforation in the Dormont connector was unusually shaped insofar as it was irregular. The presence of the slot going out from the center hole could only happen by contact with a metal edge.

7. The presence of molten metal splatter on the air side of the convolute next to the “red” perforation was identified as iron. This indicates there was other metal surface contact areas in addition to the stainless steel Dormont connector.

In my opinion, this failure was caused by a short circuit condition which perforated the Dormont connector.

## 3.0 QUALIFICATIONS

My name is Richard Hoffmann. I am the founder, President and Chief Metallurgical Engineer of my own metallurgical engineering firm, R. A. Hoffmann Engineering, P.C. d/b/a Hoffmann & Feige (H&F).

I am a trained professional engineer licensed to practice in the states of New York, Connecticut, New Jersey, Pennsylvania, Montana, and Nevada. I hold two academic degrees: a B.S. and an M.S. in Metallurgical Engineering, both from Brooklyn Polytechnic Institute / New York University.

H&F is a small business / technical consulting organization founded by me in 1976 and now employing ten engineers, technicians, and supporting staff.

We have expertise in materials applications and forensics in ferrous and non-ferrous materials, corrosion, cryogenics, high temperature applications; we perform quality assurance audits, failure analyses, inspections, corrosion evaluations, and remaining life assessments of piping systems and equipment.

I have built a fully-equipped metallurgical laboratory with a scanning electron microscope with energy dispersive spectroscopy capabilities, servicing a diversified group of utilities (gas, LNG, LP and power), building owners and managers, insurance companies, attorneys, manufacturers, fabricators, and design engineering firms.

In a managerial capacity, I establish and coordinate corporate goals, review staff and equipment requirements, direct proposal planning, and provide hands-on technical guidance and corporate supervision of ongoing projects.

I actively participate in several national technical committee activities:

- National Fire Protection Association:
  NFPA 58 – Liquefied Petroleum Gas - Technical Chairman;
  NFPA 59 – Utility LP Gas Plant Code;
  NFPA 59A – Liquefied Natural Gas and the

- American Concrete Institute - ACI 376 - Design and Construction of Concrete Cryogenic Tankage for Liquefied Gases.

In addition, I hold the following technical certifications:

- American Welding Society (AWS) Certified Welding Inspector (CWI), and

- National Association of Corrosion Engineers (NACE) Certified Corrosion Specialist P Grade.

My professional résumé is provided as Appendix A. Appendix B is a list of my testimony over the past five years.

Hoffmann & Feige bills for my time at a rate of $260 per hour. Neither Hoffmann & Feige's nor my compensation is dependent on the outcome of this matter. I have received no additional compensation for my work in this case and my compensation does not depend upon the contents of this report, any testimony I may provide, or the ultimate outcome of the case.

## 4.0 BACKGROUND

### 4.1 Background and Objective

The objective of this investigation was to identify the proximate cause of gas leakage associated with the two perforations in the Dormont fabricated stainless steel connector installed between the hard-mounted on-off gas supply valve, and the Jenn-Air electric-and-gas stove, which was installed in what appears to be a normal kitchen countertop arrangement.

### 4.2 The Incident

The house was built by Anthony Domingue in the 2006-2007 time period[1]. The stove was purchased by him from a firm called Stine's[2] and was the only appliance not installed by him[3].

When the stove was about five years old, the ownership of the house located at 12254 Fairlane Road, St. Francisville, LA70775 changed on December 29, 2011[4] from Anthony Domingue, the builder, to David Doucet and Suzanne Doucet.

The incident took place on January 15th, 2012, when Suzanne Doucet was preheating the lower oven for the first time[5].

The fire that ensued was ultimately extinguished by the volunteer fire department which arrived approximately 10 minutes after the initial call[6].

The range was then removed from the kitchen area (Figure 1) and brought out to the wooden deck for subsequent analysis (Figures 2 and 3).

The stove was initially examined by the writer at the M. A. Stringer & Associates, Inc., laboratory facility in Metairie, LA on February 13, 2013. The condition of the Dormont Connector was as shown in upper photograph in Figure 4.

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[1] Deposition of Anthony Domingue - March 11, 2014 - Page 13

[2] Ibid - March 11, 2014 - Page 17

[3] Ibid - March 11, 2014 - Page 17

[4] Ibid- March 11, 2014 - Page 18.

[5] Deposition of Suzanne Doucet - March 10, 2014 - Page 41 and 42.

[6] Ibid - March 10, 2014 - Pages 48, 49 and 50.

A second examination ot the Doucet Jenn-Air Range and Dormont connector was conducted at the Materials Evaluation and Engineering, Inc. (MEEI) facility in Plymouth, MN on May 21 and 22, 2014.

This report presents the results of the analyses performed at that facility.

## 5.0 FINDINGS

5.1 Doucet - Dormont Connector - Model 30 - 3131 - 48[7]

The Dormont connector was shipped to MEEI inside the oven compartment as shown in the lower photograph of Figure 4. The end of the Dormont connector (with the identification tag) is the end that was inserted into the Maxitrol regulator valve, which is hard mounted on the lower right side of the back structure of the oven as seen looking at the back of the oven, Figure 2. The inlet or the supply side of the connector is in the foreground of the lower photograph of Figure 4.

The Dormont connector was identified as a Model 30-3131-48 unit. The date code on the copper alloy nut was 3 06 C, which identifies the part as being manufactured in March 2006 by the 3rd shift. The hose was a 0.5-inch interior diameter component that was measured, when straightened out, to be 47 inches in overall length, exclusive of the screwed-in end fittings, Figure 5.

Examination of the Figure 4 photographs shows the presence of a green plastic ribbon around the hose. This green ribbon identified the first leak in the Dormont Connector which was identified in the February 13, 2013 inspection in Metairie, LA.

Gas leak testing at the MEEI facility on May 21-22, 2014 showed the presence of a second perforation in the Dormont connector. This second perforation was identified as the red hole, since it was outlined with a red marking pen.

Because of the extreme twisting present in each end of this connector, (which was believed to have been introduced during unscrewing from the hard mounted connection points in the 12254 Fairlane Road, St. Francisville, LA kitchen, Figure 2), the identification of the alignment and the general location of these two holes / perforations in this Dormont Connector, it was necessary to straighten this unit out as shown in Figure 5.

To assist this investigation, an identical exemplar Dormont Connector was purchased to aid in orientation and to minimize handling of this actual Doucet Dormont Connector. This exemplar connector is shown in Figures 5, 6 and 7.

A summary of the distribution of the photographs associated with the red and green holes is shown in Table 1.

[7]Answers and Objections to Plaintiffs' Interrogatories - Page 11. Interrogatory No. 15.

| Table 1<br>Distance Dimensions (inches) Associated with Perforations in the Dormont Connector<br>Doucet - St. Francisville, LA, January 15, 2012 – Figure 5 | | | | |
|---|---|---|---|---|
| | Distances - Red Hole | | Distances - Green Hole | |
| Overall Hose Length | From Inlet End of Connector Which Was Hard Mounted on Back Wall | From Outlet End / Supply to Mounted-on-range Regulator | From Inlet End of Connector Which Was Hard Mounted on Back Wall | From Outlet End / Supply to Mounted-on-range Regulator |
| 47 Inches | 15 | 32 | 23 | 24 |
| Figures | 7, 8, 9, 12, 13, 20, 21, 22, 23, 24, 25, | | 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, | |

The visual examination of these two perforations showed:

1. The red and green perforation holes were in the same axial / rotational orientation alignment.

2. The longitudinal seam weld introduced during the fabrication of the formed connector was not associated with these perforations.

3. Both perforations exhibited elevated temperature conditions; melted metal, and spatter surrounded both openings.

4. The red hole was irregular, with a slot extending from one side of the opening, representative of an edge-contact condition.

5.2 Lower Oven Heating Element Electrical Connectors - Figures 2, 3, 26 - 32.

Visual examination of the back surface of the Jenn-Air range showed the presence of a blackened area near the left bottom of the back of the stove, as seen when looking at the back of the stove - Figures 2 and 3. This area was the corner where there was the most fire damage in the kitchen - Figure 1.

For this investigation, these two connectors were identified as right and left connectors - Figure 28. Further visual examination showed that the left electrical connector, shown in Figures 28 and 32, did not exhibit any visual evidence of metal contact, which the right connector did, as evidenced by the presence of melted mounds on the strain relief ring of the right electrical connector - Figure 29, 30 and 31. No destructive metallurgical examination were performed on these mounds.

5.3 Scanning Electron Microscope / Energy Dispersive Spectroscopy

Representative samples were examined in the SEM/EDS system to understand the nature of the damage, and to determine existing conditions on:

1. The red and green holes and on the Dormont Connector perforations
2. The right lower oven connector, and
3. The surface differences observed on the steel outer protective backing sheet on the oven.

The results of these analyses are reported in Tables 4-1, 4-2, 4-3, and 4-4.

Green Hole - Figures 16 - 19

*Air Side*

Eight EDS analyses were performed on the perimeter edges of the perforation. One EDS analysis was performed on the spatter. The results were all similar and showed the basic composition of the Dormont connector material: a 304 type stainless steel.

*Product Side*

One EDS analysis was performed on the perimeter and two EDS analyses were performed on spatter. The results were similar to the findings on the air side of the perforation.

Red Hole - Figures 22 and 23, Figure 24 and 25.

*Air Side*

Three EDS analyses were performed on the perimeter edges of the perforation and one EDS analysis was performed on the outer surface. These results were similar and showed the basic composition of the Dormont connector material: a 304 type stainless steel.

Two EDS analysis was performed on the spatter on the outer air side of the adjacent convolute, Figure 24. These EDS analyses were different than the other perimeter analyses and represented mostly iron. This difference indicated that a material other than the Dormont Connector material was involved with this incident.

*Product Side*

One EDS analysis was performed on the perimeter, two EDS analyses were performed on spatter, one performed on what was identified as “drop through” and

one EDS analysis performed on the side of the convolute. These results were similar to the base metal composition associated with the Dormont Connector.

Right Lower Heating Element Electrical Connector - Figures 33 - 34, 35 - 38

In order to determine the basic materials of construction of the right connector associated with the lower oven heating element, the outer surface and the thickness of the connector were evaluated, Figures 33 and 34. These showed the electrical connector to be a nickel-plated iron product, which contained a slight amount of manganese.

Three mounds (molten drops) were observed on the strain relief of the connector – Figure 29. These mounds were analyzed in the as-ultrasonically-cleaned condition (Figures 35, 36) and following sanding to examine the substrate material, Figures 37 and 38.

The EDS results showed the mounds to contain elevated levels of chromium and nickel. Since the part is nickel plated, the only element of interest is the chromium, since that could only come from the Dormont connector material of construction, which is a type 304 stainless steel. The source of the antimony (Sb) could not be explained.

Analysis of Surface Areas - Steel Backing Sheet - Figures - 26, 27, 39, 40, 41.

In an effort to locate areas where there may have been electrical contact between the Dormont Connector and the Steel Backing Sheet on the back of the range, several areas that visually appeared to be of interest were removed and subjected to EDS analysis in the SEM. These areas are shown in Figures 27, 39 and 40.

SEM/EDS analyses of these areas, together with alloy mapping of the area shown in Figure 41, which was located directly above the lower electrode connection opening failed to reveal any areas where there was any contact between the Dormont Connector and these surfaces or edges. These analyses showed the presence of high levels of zinc, which is associated with the use of galvanized steel sheet for this product.

## 6.0 CONCLUSIONS

The work and the analyses described herein and the documents reviewed has shown:

1. The fire in the Doucet kitchen at 12254 Fairlane Road, St. Francisville, Louisiana, was the result of perforations introduced to the Dormont connector which ran between the Jenn-air stove and the hard mounted gas valve on the wall behind the stove; the fire occurred because of unexpected electrical contact between the Dormont connector and the electrical connector powering the heating element associated with the lower oven.

   Based on the deposition of Suzanne Doucet, it was believed to be the first use of this lower oven unit on this range since the Doucet family purchased the house.

2. This electrical interaction produced two perforations in the Dormont Connector at the 15 inch (Red Hole) and 23 inch (Green Hole) from the inlet end of the connector.

3. Evidence of metal-to-metal contact (mounds) was observed on the right electrical connector on the lower heating element connector. EDS analysis of these molten metal contact areas showed an elevated level of chromium, which could only come from the Dormont connector.

4. The finding of the axial / rotational alignment of the red and green holes indicated that the sides of contact were identical. In other words, if either perforation contacted any electrode, the other perforation faced the same way, i.e., it would be facing the back of the oven.

5. The placement of the perforations in the Dormont connector against the protruding lower oven heating element electrodes is supported by the irregular shape of the red perforation.

   The parallel-sided material loss area extending from the round area could only have come from contact with some sort of metallic edge.

6. The physical protection for the lower oven heating element electrodes was not available for examination, nor was it shown in any of the photographs examined.

   There was a screw hole in the bottom area of the protective steel sheet directly above the opening for the lower oven element electrical connectors on the back of the range that, in my opinion, was made for the attachment of this protective cover plate, which was not in place at the time of the fire.

7. The presence of a splatter of molten metal on the air side of the convolute next to the red perforation which was identified as being plain iron indicates that there was other metal surface contact areas other than just the Dormont connector contact.

In summary, this investigation has shown that this incident would never have occurred if the protection plate covering the lower oven element electrodes had been in place.

*Please be advised that the following Sections 7.0 and 8.0 of this report were peer reviewed by Mr. Richard Kertesz of this firm. Mr. Kertesz is an electrical engineer and a Registered Accreditation Board Auditor.*

## 7.0 DORMONT QUALITY SYSTEM AND PRODUCT CERTIFICATION[8]

Our review of the Dormont Quality Certificate of Registration for their Quality Management System which complies with the requirements of **BS EN ISO 9001-2000** clearly verifies that Dormont is an ISO Registered Company: "Their Quality System is Registered"

The scope of their registration covers the product design and manufacture of gas and fluid conveyance products. This verifies that Dormont has designed and implemented a Quality Management System[9] for their product design, manufacturing, inspection and testing processes.

This QMS system should assure all Dormont customers that they are receiving a product that is manufactured, tested, and accepted to controlled procedures by qualified personnel. Dormont Products are Certified, meaning that their products have also been tested to meet the CSA mark.

Dormont Manufacturing also holds a Certificate of Compliance to CSA International which allows them to bear the **CSA Mark on their Gas Connector Products**. This "Mark" confirms that Dormont's Connectors for Gas Appliances conform to ANSI Z21.24-2006 and CSA 6.10-2006. These documents specify the design, manufacturing, test, acceptance, labeling and installation requirements for connectors for gas appliances.

[8] BSI Management Systems Document - Dormont Registration Number - Pages Dormont 000188 - 000237

[9] Dormont Quality Business System - Dormont Pages 000026 - 000146

## 8.0 REVIEW OF THEWAY LABS FAILURE ANALYSIS REPORT

Doucet - 14 - hclbp-1douc, dated May 12, 2014

As part of this analysis, I have reviewed the data presented in the above report and have developed the following comments:

**Table 2**
**H&F Comments**
**THEWAY Labs Failure Analysis Report - -**
***Doucet - 14 - hclbp-1douc, dated May 12, 2014***

| Item | Statement | H&F Comment |
|---|---|---|
| 9C | Like other corrugated stainless steel tubing products, arcing occurred to the pipe without touching the energized conductor, when the tubing was not bonded, as seen in the first photo | You can make the test conditions show anything you want. As he states, it is his hypothesis. |
| 9d | Similarly, arcing did not occur when bonding was less than 10 feet, as seen in the second photo | The subject Dormont connector is only 47 inches long, not 120 inches long. The maximum length of any Dormont Connector is limited to 6 feet or 72 inches. |
| 10a | Electrical discharge occurs when corrugated tubing is near components which are electrically energized. | We agree; such discharge can also occur with other metals. |
| 10b | Based on calculations shown, the corrugated tubing is penetrated by electrical energy much more easily than alternatives | These statements are generalizations. What is meant by the term “alternatives”? Are they practical for use in this configuration? |
| 10c | The product fails when exposed to adequate electrical magnetic energy, including energy from an electrical fault | We agree with this; see also 10a comment above. |
| 10d | Penetration in pipe will allow gas to escape which can be ignited by electrical discharge | This is obvious; no comment is needed, provided the flammability limits are exceeded. |

## 9.0 DOCUMENTS REVIEWED

The following documents were reviewed to render the opinions presented herein:

**TABLE 3**
**Listing of Documents Reviewed by the Writer in Preparation of this Report**.

| Date | Name | Repre-senting | What does this Cover? |
|---|---|---|---|
| 3/10/2014 | Deposition of David Doucet | Doucet | Video Deposition pgs 1-96 |
| 3/11/2014 | Subpoena of Anthony Dominque | Doucet | Subpoena and exhibits 2, 3 and 4 |
| 1/30/2014 | Answers to Interrogatories | Doucet | Answers from David Doucet, pgs. 1-15 |
| 1/30/2014 | Response to Request for Production of Documents | Doucet | Response from Suzanne Doucet, pgs. 1-8 |
| 1/30/2014 | Answers to Interrogatories | Doucet | Answers from Suzanne Doucet, pgs. 1-15 |
| 1/30/2014 | Response to Request for Production of Documents | Doucet | Response from David Doucet, pgs. 1-8 |
| 1/30/2014 | Answers to Interrogatories | Doucet | Answers from Louis Doucet, pgs. 1-6 |
| 1/30/2014 | Response to Request for Production of Documents | Doucet | Response re: Louis Doucet, pgs. 1-3 |
| 1/30/2014 | Response to Request for Production of Documents | Doucet | Response re: Mark Doucet, pgs. 1-3 |
| 1/30/2014 | Answers to Interrogatories | Doucet | Answers from Mark Doucet, pgs. 1-6 |
| 1/30/2014 | Answers to Interrogatories | Doucet | Answers from Mary Kathryn Doucet, pp. 1-6 |
| 1/30/2014 | Response to Request for Production of Documents | Doucet | Response re: Mary Kathryn Doucet, pgs. 1-3 |
| 3/10/2014 | Deposition of Suzanne Doucet | Doucet | Video Deposition pgs 1-62 |
| 3/10/2014 | Deposition of Louis Doucet | Doucet | Video Deposition pgs 1-32 |
| 3/10/2014 | Deposition of Mark Doucet | Doucet | Video Deposition pgs 1-43 |
| 3/11/2014 | Deposition of Captain Rudolf K. Shoats | Doucet | Video Deposition pgs 1-57 |
| 3/11/2014 | Deposition of Fire Chief J.R. Wood | Doucet | Video Deposition pgs 1-55 |
| 3/11/2014 | Deposition of Anthony Domingue | Doucet | pages 1-97 |
| 3/7/2014 | Supplemental Initial Disclosures of Dormont Manufacturing Co. | Dormont | |
| not dated | Dormont's Response & Objections to Requests for Production | Dormont | pages 1-8 |
| 3/10/2014 | Dormont's Answers and Objections to Interrogatories | Dormont | pages 1-12 |
| 1/15/2014 | Answers to Interrogatories | Doucet | From State Farm Insurance |
| 1/15/2014 | Reponse to Requests for Production of Documents | Doucet | From State Farm Insurance |
| 1/15/2014 | Privilege Log | Doucet | From State Farm Insurance |
| 2/4/2014 | Supplemental Answers to Interrogatories and Requests for Production of Documents | Doucet | From State Farm Insurance |
| 3/26/2014 | Second Supplemental Answers to Interrogatories and Requests for Production of Documents | Doucet | From State Farm Insurance |
| various | Drawings of Parts | Dormont | Pages labeled "Dormont 000147" through "Dormont 000187" |
| not dated | Safety Label and booklet | Dormont | Stainless Steel Gas Connector for Indoor and Outdoor Use |

**TABLE 3**
**Listing of Documents Reviewed by the Writer in Preparation of this Report.**

| Date | Name | Repre-senting | What does this Cover? |
|---|---|---|---|
| 11/20/3013 | Resume of Edward R. Brill, PE | Dormont | 6 pages |
| not dated | C.V. of Thomas R. Crane, PE | Dormont | 4 pages |
| 7/3/2012 | Letter from State Farm | Doucet | Statement of Loss |
| 6/6/2012 | Clean and Repair Project | Doucet | 25 Pages |
| 7/10/2012 | Home Inspection Report | Doucet | 98 pages |
| 2/24/2012 | ServiceMaster Mitigation Report | Doucet. | |
| 1/23/2012 | Whirlpool Incident Scene Preservation Instructions | Doucet | 3 pages |
| various | Correspondence from State Farm Insurance | Doucet | 19 pages |
| 4/12/2012 | Fire Claim Forms to State Farm from B and G Construction | Doucet | 7 pages |
| 3/23/2012 | Audit Summary Report | Doucet | 10 pages |
| 3/23/2012 | Audit Summary Report | Doucet | 10 pages |
| 3/20/2012 | Audit Summary Report | Doucet | 9 pages |
| 2/23/1012 | Audit Summary Report | Doucet | 9 pages |
| not dated | House Floor Plan | Doucet | 2 copies, 4 pages |
| not dated | Statement on each page: “No Estimate changes Report was generated due to possible duplicate room names within a level of the estimate” | Doucet | 3 pages |
| 3/23/2012 | ServiceMaster Labor Report | Doucet | 2 copies, 5 pages each |
| 3/20/2012 | ServiceMaster Labor Report | Doucet | 2 copies, 5 pages each |
| 2/3/2012 | ServiceMaster HVAC/Furnace Cleaning-photos | Doucet | 24 pages |
| 3/23/1012 | ServiceMaster Price List Variation Usage Report | Doucet | 2 pages |
| 3/23/1012 | ServiceMaster Price List Variation Usage Report | Doucet | 6 pages |
| 3/23/1012 | ServiceMaster Project Report | Doucet | 25 pages |
| 3/23/1012 | ServiceMaster Project Report | Doucet | 25 pages |
| 3/20/1012 | ServiceMaster Project Report | Doucet | 2 copies, 25 pages each |
| 1/27/2012 | Audit Summary Report | Doucet | 7 pages |
| 1/20/2012 | Audit Summary Report | Doucet | 5 pages |
| 1/30/2012 | Estimate Changes Report | Doucet | 12 pages |
| 6/18/2009 | Structural Damage Claim Policy | Doucet | 32 pages |
| 6/18/2009 | Structural Damage Claim Policy | Doucet | 7 pages |
| 1/27/2012 | Labor Report | Doucet | 10 pages |
| 1/20/2012 | Labor Report | Doucet | 3 pages |
| 1/27/2012 | Price List Variation Usage Report | Doucet | 1 page |
| 1/20/2012 | Price List Variation Usage Report | Doucet | 1 page |
| 2/13/2013 | Crane Engineering Photos | Doucet | 207 photos |
| 6/7/2014 | MASA Photos | Doucet | 195 photos |

**TABLE 3**
**Listing of Documents Reviewed by the Writer in Preparation of this Report**.

| Date | Name | Repre-senting | What does this Cover? |
|---|---|---|---|
| 9/28/2012 | State Farm Insurance Photos | Doucet | 264 photos |
| 7/12/12; 1/2/13; 2/9/13; 3/4/13; | Troy Little Photos | Doucet | 160 photos |
| 12/11/2013 | Cover Letter from Hannah, Colvin and Pipes | Doucet | 1 page |
| 11/29/2012 | Letter of Request for Fire Report | Doucet | 1 page |
| 1/17/2012 | Fire Report | Doucet | 12 pages |
| 5/12/2014 | Failure Analysis Report | Doucet | Theway Labs |
| 5/14/2014 | Letter from Christian K. Mulkey at M.A. Stringer and Associates, Inc. to Mr. Blaine Aydell, Esq. | Doucet | Fire Analysis Report |
| 5/14/2014 | Letter from Troy Little P.E. to Mr. W. Ransom Pipes | Doucet | Doucet Range Fire Investigation |

**TABLES**

**TABLE 4-1**
**Summary of EDS Results – Green Hole**

| Figure Reference: | 16 | | | 17 | | | 18 | | | 19 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location of Sample Analysis | Green Hole Air Side (1) Pt 1 | Green Hole - Air Side (1) Pt 2 | Green Hole - Air Side (1) Pt 3 | Green Hole - Air Side (2) Pt 1 | Green Hole - Air Side (2) Pt 2 | Green Hole - Air Side (2) Pt 3 | Green Hole - Air Side (3) Pt 1 | Green Hole - Air Side (3) Pt 2 | Green Hole - Air Side (3) Pt 3 | Green Hole - Product Side (1) Pt 1 | Green Hole - Product Side (1) Pt 2 | Green Hole - Product Side (1) Pt 3 |
| Element | Edge | Edge | Edge | Edge | Spatter | Edge | Edge | Edge | Edge | Spatter | Spatter | Edge |
| Na | | 0.5 | | 0.3 | | 0.5 | | 0.3 | | | | |
| Mg | | | | | | | | | | | | 0.1 |
| P | | | | 0.2 | 0.2 | 0.2 | | | 0.2 | 0.1 | | 0.1 |
| S | | 0.3 | | 0.3 | 0.2 | 0.2 | | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 |
| Cl | | 0.1 | | | | | | | | | | |
| Cr | 21.3 | 19.2 | 19.4 | 18.7 | 19.9 | 19 | 34.4 | 16.7 | 19.1 | 19.5 | 19.2 | 19.7 |
| Mn | 3.1 | 1.3 | 1.1 | 1.8 | | 1.1 | 10.2 | 0.5 | 1.2 | 0.9 | 1.1 | 1.3 |
| Fe | 68.3 | 70.5 | 72 | 71.2 | 72.5 | 71.4 | 50.4 | 73.8 | 71.4 | 71.7 | 72 | 71.2 |
| Ni | 7.3 | 8.1 | 7.4 | 7.4 | 7.2 | 7.6 | 5.1 | 8.6 | 7.9 | 7.7 | 7.4 | 7.2 |

**TABLE 4 -2**
**Summary of EDS Results – Red Hole**

| Figure Reference: | 22 | | | 23 | 24 | | 25 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Location of Sample Analysis | Red Hole - Outer Surface - (1) Pt 1 | Red Hole - Outer Surface - (1) Pt 2 | Red Hole - Outer Surface - (1) Pt 3 | Red Hole - Outer Surface - (2) Pt 1 | Red Hole Outer Surface Sidewall of Adjacent Convolute (1) Pt 1 | Red Hole Outer Surface Sidewall of Adjacent Convolute (1) Pt 2 | Red Hole Product Side (1) Pt 1 | Red Hole Product Side (1) Pt 2 | Red Hole Product Side (1) Pt 3 | Red Hole Product Side (1) Pt 4 | Red Hole Product Side (1) Pt 5 |
| Element | Surface | Edge | Edge | Edge | Spatter | Spatter | Spatter | Spatter | Surface | Edge | Drop Through |
| Na | 2.5 | | | | 0.8 | 0.2 | 0.8 | 0.7 | | | |
| Mg | | | | | | | | | | | |
| P | 0.3 | 0.2 | | 0.2 | 0.4 | | 0.9 | 1.1 | 0.1 | 1.1 | |
| S | 0.4 | 0.4 | 0.2 | 0.4 | | | 0.3 | 0.4 | 0.2 | | 0.3 |
| K | 0.1 | | | | | | | | | | |
| Ca | 0.6 | | | | 0.8 | | 0.3 | 0.5 | | | 0.1 |
| Cr | 18.8 | 17.5 | 19 | 19.6 | 0.6 | 0.4 | 16.4 | 16.2 | 19.3 | 30.8 | 19.7 |
| Mn | 1 | 1.5 | 1.1 | 1.5 | 0.2 | 0.2 | 1.3 | 0.9 | 1.3 | 2.4 | 1.5 |
| Fe | 68.6 | 68.7 | 71.5 | 69.1 | 97.3 | 99.2 | 73.1 | 72.4 | 71.6 | 57.6 | 71.6 |
| Ni | 7 | 6.7 | 7.7 | 7.1 | | | 6.8 | 6.6 | 7.5 | 8.1 | 6.8 |
| Cu | | | 0.6 | | | | | | | | |
| Ba | 0.5 | 5 | | 2.1 | | | | 1.1 | | | |

**TABLE 4-3**
**Summary of EDS Results – Connector**

| Figure Reference: | 33 | 34 | | 35 | | | 36 | | | | 37 | | | 38 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location of Sample Analysis<br>Element | Right Connector from Lower Heating Element (3) Pt 1 | Right Connector from Lower Heating Element - Sanded - (1) Pt 1 | Right Connector from Lower Heating Element - Sanded - (1 Pt 2 | Right Connector from Lower Heating Element (1) Pt 1 | Right Connector from Lower Heating Element (1) Pt 2 | Right Connector from Lower Heating Element (1) Pt 3 | Right Connector from Lower Heating Element (2) Pt 1 | Right Connector from Lower Heating Element (2) Pt 2 | Right Connector from Lower Heating Element (2) Pt 3 | Right Connector from Lower Heating Element (2) Pt 4 | Right Connector from Lower Heating Element Sanded Mound 2 (1) Pt 1 | Right Connector from Lower Heating Element Sanded Mound 2 (1) Pt 2 | Right Connector from Lower Heating Element Sanded Mound 2 (1) Pt 3 | Right Connector from Lower Heating Element Sanded Mound 1 (1) Pt 1 | Right Connector from Lower Heating Element Sanded Mound 1 (1) Pt 2 | Right Connector from Lower Heating Element Sanded Mound 1 (1) Pt 3 |
| Na | | | | | | 1.4 | | | | | | | | | | |
| P | | | | 0.2 | | 2.4 | | | 0.2 | 0.2 | | | | | | |
| S | | | | | | | | | | | | | 0.3 | | | |
| Ca | | | | | | | | 0.1 | | 0.2 | | | | | | |
| Cr | | | | 0.2 | | | 0.3 | 0.3 | 0.3 | 0.4 | 0.2 | 0.2 | 0.4 | 0.2 | 0.1 | 0.1 |
| Mn | | | 0.5 | 0.4 | 0.6 | | 0.5 | 0.5 | 1.2 | | 0.6 | 0.5 | 0.5 | 0.3 | 0.4 | 0.4 |
| Fe | 5 | 4.2 | 99.5 | 92.3 | 92.9 | 89.1 | 94.3 | 93.6 | 94.8 | 96.9 | 94.1 | 94.7 | 96.1 | 94.9 | 95.6 | 95.4 |
| Ni | 95 | 95.8 | | 6.9 | 5.8 | 4.7 | 5 | 5.4 | 1 | 2.3 | 5.2 | 4.6 | 2.7 | 4.6 | 3.9 | 4.1 |
| Sb | | | | | 0.6 | 2.4 | | | 2.5 | | | | | | | |

| TABLE 4-4<br>Summary of EDS Results –<br>Jenn-air Back Sheet | | |
|---|---|---|
| Figure Reference: | 39, 40, 41 | |
| Location of Sample Analysis | Steel Protective Panel at Lower Heating Element (1) Pt 1 | Steel Protective Panel at Lower Heating Element (1) Pt 2 |
| Element | | |
| P | 0.4 | 1.1 |
| S | | 0.9 |
| Ca | 0.2 | 3.5 |
| Fe | 12.6 | 14.3 |
| Zn | 86.8 | 80.2 |

HOFFMANN & FEIGE

R. A. HOFFMANN ENGINEERING, P.C. D/B/A HOFFMANN & FEIGE
CROTON RIVER EXECUTIVE PARK, 3 FALLSVIEW LANE, BREWSTER, NEW YORK 10509

TELEPHONE: 845/277-4401 FAX: 845/277-4701 INTERNET: E-MAIL: metalmen@hoffmann-feige.com
Web Site : www.hoffmann-feige.com

**RESUME OF RICHARD A. HOFFMANN, P.E.**
**President and Chief Metallurgical Engineer**

EDUCATION: M.S. Metallurgical Engineering, 1968
The Polytechnic Institute of Brooklyn, Brooklyn, NY
(now The Polytechnic University of New York)

B.S. Metallurgical Engineering, 1964
The Polytechnic Institute of Brooklyn, Brooklyn, NY

PROFESSIONAL CERTIFICATIONS:

- Licensed Professional Engineer
  New York State License #60591 Connecticut License #16015
  New Jersey License #38871 Montana License #13040PE
  Nevada License #14003 Pennsylvania # PE080799

- American Welding Society
  Certified Weld Inspector #85050021

- National Association of Corrosion Engineers (NACE)
  Accredited Corrosion Specialist, P #2900

- Member - International Association of Experts (Inter-Expert) - Metz, France. - Member No 827

EXPERIENCE:

1978 to Present **HOFFMANN & FEIGE, BREWSTER, NEW YORK**

President of materials engineering consulting firm with staff of 12 and a fully-equipped metallurgical laboratory with SEM/EDAX, servicing a diversified group of utilities (gas, LNG and power), building owners and managers, manufacturers, fabricators and design engineering firms. He has created a technical consulting organization which has grown from his personal technical initiatives into a small multi-faceted corporation with expertise in materials applications and failure analysis (ferrous & non-ferrous materials, corrosion, cryogenics, high temperatures), quality assurance audits, inspection and corrosion evaluation of piping systems and equipment.

Mr. Hoffmann establishes and coordinates corporate goals, reviews staff/equipment requirements, directs proposal planning, and provides hands-on technical guidance and corporate approval to ongoing projects. His personal insight into failure analysis, built over years of experience, is a major asset to corporate activities. In maintaining a broad range of customer interfaces, Mr. Hoffmann actively participates in pertinent

national technical committee activities. He personally holds several technical certifications and licenses.

1976 to 1978 **R. A. HOFFMANN COMPANY, KATONAH, NEW YORK**

President of materials engineering consulting firm, a forerunner of Hoffmann & Feige.

1973 to 1976 **J. A. KLAPPER COMPANY, ELMSFORD, NEW YORK**

Technical Manager responsible for fabrication, testing and inspection of pressure containment vessels and components for elevated (high temperature gas turbine), ambient and cryogenic (LNG) temperature service. Ferrous and nonferrous materials, welding & joining, nondestructive testing laboratory. ASME, API and ABS Codes. Development and production of Quality Assurance Manuals.

Developed comprehensive test program to evaluate long term stability of LNG materials of construction under service conditions. Involved with fracture analysis and control and the verification of inspection technique selection based on flaw detection threshold.

1964 to 1973 **GRUMMAN AEROSPACE CORPORATION, BETHPAGE, NY**

LUNAR MODULE Staff Metallurgical/Materials Engineer responsible for:

- Design
- Materials selection - metallic (aluminum, magnesium, high strength steels & stainless steels, titanium) & nonmetallics
- Fabrication
- Corrosion protection finishing of all structures and components
- Instruments
- Pyrotechnics and Explosive Devices
- Electrical/electronics
- Inspection
- Corrosion studies of materials of construction exposed to fluids of fabrication and operation.

Metallurgical Engineer - Quality Control Engineering and Advanced Development. Responsible for fabrication of large welded high strength steel test bed needed for high speed/high temperature structural panel evaluation work. Developed nondestructive metallurgical test in examination of high strength stainless steel fasteners which resulted in extensive savings on retrofits. Established weld procedures to eliminate jet engine tail pipe cracking on A-6 Intruder.

Project Engineer responsible for creation of specific weld defects in several titanium alloys using different welding processes (EB, PAW, GTAW and GMAW) in order to evaluate their effect on the mechanical properties of those materials in the welded condition. Prototype failure analyses; metallic and non-metallic materials;

INDUSTRIAL ORGANIZATIONS SUPPORTED:

- New England Gas Association (NEGA) Instructor at Annual Gas Operations School - 1978 to 2005

- American Gas Association (AGA)
  Assisted the authorship of the LNG Section of the AGA GEOP publication *Supply*.
  Presented papers in 1993 and 2007 Conventions on Aging of LNG Plants
  Presented paper in 1996 on Changes in the NFPA 59A Code
  1997 Operations Conference - A Progress Review of the NFPA Petition to US DOT Regarding the Integration of NFPA 59A into 49CFR193. -

- NFPA (National Fire Protection Association) Technical Committees:
  58 Storage and Handling of Liquefied Petroleum Gases -
  Present Chairman - NFPA 58 Technical Committee
  59 LP-Gases at Utility Gas Plants
  59A Production, Storage and Handling of Liquefied Natural Gas – Past Chairman and present Secretary of Technical Committee

- American Concrete Institute - Member of Technical Committee - ACI 376 - Code Requirements for Design and Construction of Concrete Structures for the Containment of Refrigerated Liquefied Gases and Commentary

- Building Owners' and Managers' Association of Greater New York, Inc. (BOMA/NY)
  Member of Environmental Task Force and Co-Author of BOMA/NY White Paper, "Water Treatment", 1992
  BOMA International publication *Skylines,* "Corrosion and Water Treatment", July 1989
  BOMA/NY Annual Magazine, *BOMA, New York*, "A Review of the Effects of Naturally Corrosive Waters on Metallic Piping and Containment Systems", 1991.

- National Association of Corrosion Engineers (NACE). Author of paper presented at NACE Conferences:
  *Corrosion 93*: Case Histories of Microbiologically Influenced Corrosion In Building and Power Generation Systems
  *Corrosion 96*: Case Histories of On-Line and Off-Line Cleaning of HVAC Piping Systems (co-authored with Arthur J. Freedman, PhD)
  *Corrosion 97*: Corrosion and Corrosion Control in Building Water and HVAC Systems – Nondestructive and Destructive Methods to Evaluate Building Piping Systems (co-authored with Arthur J. Freedman, PhD)
  *Corrosion 98*: Corrosion Failures of Copper/Copper Alloy Piping in Building Piping Systems
  *Corrosion 2000*: Selection and Protection of Metals in Building HVAC Systems (co-authored with Irvin J. Cotton and Arthur J. Freedman, PhD)

- American Concrete Institute - Paper presented at 2006 Charlotte NC Annual Convention: Concrete, Steels, Stresses and Very Cold Temperatures - Concrete Containment Structures for Cryogenic Liquids

ADDITIONAL PROFESSIONAL MEMBERSHIPS:

American Society for Metals International (ASM)
American Society For Testing and Materials (ASTM)
American Welding Society (AWS)
National Association of Corrosion Engineers (NACE)

# APPENDIX B

# LEGAL TESTIMONY OF RICHARD A. HOFFMANN, P.E.

HOFFMANN & FEIGE

R. A. HOFFMANN ENGINEERING, P.C. *D/B/A* HOFFMANN & FEIGE
CROTON RIVER EXECUTIVE PARK, 3 FALLSVIEW LANE, BREWSTER, NEW YORK 10509

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Web Site : www.hoffmann-feige.com

**FOUR-YEAR LIST OF COURT TESTIMONY AND DEPOSITIONS**
**OF**
**RICHARD A. HOFFMANN, P.E.**
**June 10, 2014**

## I. COURT TESTIMONY

**James T. Moser III, et al. V. Atmos Energy Corporation, et al.,**

**Circuit Court of Hinds County, Mississippi, First Judicial District, Cause No.: 251-10-1082-CIV**

Testified on May 23, 2014 on behalf of Hemphill Construction Company, Inc., Florence, MS presenting opinions as to the cause of the separation failure of a 3/4 inch Dresser Style 90, 90° elbow coupling and a natural gas service line to a home which ultimately resulted in a personal injury fire.

Attorney Robert Galloway
Butler, Snow, O'Mara, Stevens & Cannada PLLC,
Gulfport, MS

**Utica Mutual Insurance Company a/s/o Ares Printing and Packaging Corp v. Brooklyn Navy Yard Development Corp., The City of New York and Metropolitan Artificial,**

**Supreme Court of the State of New York, County of Kings, Index No.: 1 1082/04**

Testified on April 5, 2013 on behalf of the Brooklyn Navy Yard Development Corporation at Brooklyn Supreme Court. Dissimilar metals corrosion issue which caused significant portable water damage in facility. Testified to corrosion rates and age of installation.

William Ryan, Esq., Ryan & Conlon, LLP,
2 Wall Street, Suite 710
New York, New York 10005

## II. DEPOSITIONS:

**The Estate of Vincent Robert Unczur, *et al.* v. Eaton Corporation, *et.al.* U.S. District Court - Northern District of New York. Civil Action No. 5:12-CV-01367**

Retained by Paul Longeretta, Esq, of the Longeretta Law Firm, 298 Genesee Street, Utica, NY 13502. 315 735 6162

Deposed on February 20, 2014. Represented the decedent. Analysis of failed 3/4" AEROQUIP - GH 781-12, Aeroquip MATCHMATE Plus™ hydraulic hose. Defended my report 2790-RPT1, dated August 30, 2013

**James T. Moser III, et al. V. Atmos Energy Corporation, et al., Circuit Court of Hinds County, Mississippi, First Judicial District, Cause No.: 251-10-1082-CIV**

Deposed on February 13, 2014. Represented Hemphill Construction Company, Inc., Florence, MS. Retained by Butler, Snow, O'Mara, Stevens & Cannada PLLC, Gulfport, MS, The First Bank Building, 1300 25th Street, Suite 204, Gulfport, MS 39501 - Robert Galloway, Esq., 228 575 3019

Case involved pull-out failure of a 3/4" gas service line and a Dresser style 90 90° Elbow coupling. Defended my report 2974-RPT-1, dated November 27, 2013.

**Acadia Insurance Company, as subrogee of Stratton Condominium Association, Plaintiff - v.- Hampshire Fire Protection, LLC and Globe Fire Sprinkler Corporation**

Deposed on November 22, 2011 - represented Acadia Insurance Company through Law Offices of Robert A. Stutman, P.C., Berlin, NJ.

Questioned regarding expert metallurgical report that I developed regarding premature sprinkler activation in facility. Defended my report 2750-RPT-1, dated June 30, 2011

Thomas J. Underwood, Jr. Esq. - Law Offices of Robert A. Stutman, P.C.
20 East Taunton Road, Suite 403, Berlin, NJ 08009 856 767 6800

**Englebrick v. Worthington Industries, et.al. - USDC Case No. : 8:08-cv-01296-CJC-MLG**

Deposed on June 19th, 2010 in response to Federal Subpoena. Testified as to MAPP gas cylinder failures which I was familiar with. Deposition reviewed cause of failure and my substantiation to my report 2029-RPT-1, which dealt with a MAPP gas cylinder failure in Idaho, which was issued on February 20, 2003.

Kevin G. Liebeck, Esq. 949-640-8222
Hodes Milman, LLP
9210 Irvine Center Drive, Irvine, CA 92618

## III Arbitration Support

Myrtle Avenue Builders, LLC, - v - Ro-Sal Plumbing & Heating, Inc. -
Case 13 110 01183 10

Gave testimony at arbitration hearing - August 1, 2011. Addressed quality of workmanship in high-rise building piping assemblies, analyzed roll-groove coupling workmanship in steel and copper piping and solder joint quality.

Robert Banner, Esq. 212 907 9654
Ingram Yuzek Gainen Carroll & Bertolotti, LLP
250 Park Avenue
New York, NY 10177

UNITED STATES DISTRICT COURT
MIDDLE DISTRICT OF LOUISIANA

| | | |
|---|---|---|
| DAVID DOUCET AND SUZANNE DOUCET, INDIVIDUALLY AND ON BEHALF OF THEIR MINOR CHILDREN, MAY KATHRYN DOUCET, MARK DOUCET, AND LOUIS DOUCET; AND STATE FARM FIRE AND CASUALTY COMPANY, | : | |
| PLAINTIFFS | : | |
| VS. | : | CIVIL ACTION NO: 3:13-cv-00251 |
| DORMONT MANUFACTURING COMPANY, | : | |
| DEFENDANT | : | |

DEPOSITION OF: MICHAEL ANGUS

TAKEN BY: PLAINTIFFS

BEFORE: SUSAN K. MORRIS
NOTARY PUBLIC

DATE: MARCH 25, 2014
10:41 A.M.

PLACE: WCCC BUSHY RUN EDUCATION CENTER
ROOM 9101
6707 MELLON ROAD
EXPORT, PENNSYLVANIA 15632

A P P E A R A N C E S:

HANNAH, COLVIN & PIPES
RANDY PIPES, ESQUIRE (via video conference)
BLAINE T. AYDELL, ESQUIRE (via video conference)
10626 Timberline Drive
Baton Rouge, Louisiana 70810
225-766-8240
APPEARING ON BEHALF OF THE PLAINTIFFS

McCOY, LEAVITT, LASKEY, LLC
H. BROOK LASKEY, ESQUIRE
1805 Rio Grande Boulevard NW, Suite 2
Albuquerque, New Mexico 87104
800-599-8300
APPEARING ON BEHALF OF THE DEFENDANT

I N D E X



E X H I B I T S

MICHAEL ANGUS, called as a witness, being sworn, testified as follows:

EXAMINATION

BY MR. PIPES:

**Q Mr. Angus, again, my name is Randy Pipes. We're here to take the corporate deposition of Dormont. Dormont has selected you the lucky one to be its representative.**

**Are you familiar with a corporate deposition?**

A I have never done one before, but I'm somewhat familiar with it.

**Q Okay. We sent a notice of deposition, and it listed 13 general topics of inquiry that we're going to cover today. Have you seen that document?**

A Yes, I have.

**Q Are you the representative that is capable of answering questions on all 13 of those areas of inquiry?**

MR. LASKEY: This is Brook. Let me insert

that if there is anybody, it's him. There may be topics on which there is no one from Dormont to provide testimony.

MR. PIPES: Okay. Before we get started, can we look at the notice and tell me before we start what topics Mike is not able to cover?

MR. LASKEY: Sure. By way of example, Number 4, any and all testing/investigation into the subject fire and/or plaintiff's allegations, Dormont received a notice letter, retained me immediately, and I've handled everything since then. So Dormont has not done any testing or investigation into the subject fire or the plaintiff's allegations outside of my office.

MR. PIPES: Okay. Obviously, subject to attorney/client privilege, is Mike able to answer questions as to what has been done on Dormont's behalf by you or those retained by you?

MR. LASKEY: No, I don't think he can. But I can tell you we haven't done any -- there has been nothing other than the evidence examination and the depositions to date.

MR. PIPES: Okay. I believe in the discovery responses there were two experts identified, Chuck Keith and Richard Hoffman.

MR. LASKEY: I think we actually have four -- I'm sorry, go ahead.

MR. PIPES: Were those individuals involved with the origin and cause investigation?

MR. LASKEY: There were four who were listed. Chuck Keith was involved -- is involved with the ongoing origin and cause investigation. Richard Hoffman is -- he's been retained as a metallurgist. I guess technically that's part of the origin and cause investigation. We have also retained, as per that letter, Ed Brill, who is an electrical engineer, and Tom Crane, who is a standards expert. But I can tell you that no one from Dormont will have any knowledge of any of their opinions to date.

MR. PIPES: Okay. And continuing from there, beyond Number 4, are there any other areas in which Mike will not be able to respond on behalf of Dormont?

MR. LASKEY: Number 9 involves similar competitor products. I'll let you talk to him about that one, but in the broad stroke, he'll tell you that Dormont has very little knowledge of similar competitor products, but you can ask him details about that. The same thing with Number 10 involving CSST.

MR. PIPES: Well, it's okay if the company

itself doesn't have much knowledge. I just need to make sure that he's able to tell me that on behalf of the company.

MR. LASKEY: Yes.

MR. PIPES: Okay. And what was the other area that you said?

MR. LASKEY: For all of these, he is the person to talk on behalf of the company. My point is that on some of these the company will have little to no knowledge.

MR. PIPES: Okay. Well, that's okay. I just want to make sure that he's the one that can express that on behalf of the company.

MR. LASKEY: Okay.

MR. PIPES: All right.

BY MR. PIPES:

**Q I've been calling you Mike, Mr. Angus. Do you mind if I call you Mike?**

A No, that's fine.

**Q What is your position with Dormont?**

A My title is director of new product development.

**Q How long have you held that position?**

A Since 2006.

**Q Was that a new position created for you,**

**or was there someone you succeeded in that position?**

A I succeeded somebody.

**Q And who was that?**

A Directly prior to me was John Kolson.

**Q How do you spell Kolson?**

A K-O-L-S-O-N.

**Q Is Mr. Kolson still with Dormont?**

A Technically, he is an employee of Watts Water Technologies now, which is our parent company.

**Q That was my next question. Watts Water Technologies is the parent of Dormont?**

A That is correct.

**Q And how long has it been the parent company?**

A Since December 2005.

**Q Was Dormont wholly owned prior to December of 2005?**

A We were privately held.

**Q How long have you been with Dormont?**

A Since December 1998.

**Q When was Dormont actually -- when did it originate as a company or corporation?**

A I believe 1975 but not 100 percent sure about that.

**Q How long has Dormont been producing gas**

**supply lines such as the type at issue in this case?**

MR. LASKEY: Object to the form.

THE WITNESS: What does that mean?

MR. PIPES: You can answer subject to his objection.

MR. LASKEY: You can answer. Just listen carefully to his question. I'm sure you understand it. A Judge will possibly rule on it later on, but you can answer the question.

MR. PIPES: I'll rephrase the question.

BY MR. PIPES:

**Q How long has Dormont been producing or manufacturing gas supply lines?**

A I'm not sure of the exact date when Dormont first started supplying gas appliance connectors to the market. I honestly don't know the answer to that question as far as what year was the first sell of gas appliance connectors to the market. I can speak to when we started selling product that was listed by CSA to the market.

**Q Let me ask this: In 1998, when you came on board with Dormont, was Dormont producing gas appliance connectors?**

A Yes.

**Q And let's make sure we're on the same page**

**throughout the deposition with our terminology. The product at issue in this case, how do you identify that product; what is the label you apply to it?**

A It is a gas appliance connector.

**Q Does Dormont make gas appliance connectors that are different in design or composition than that at issue in this case?**

A I'm sorry, could you rephrase that question?

**Q The gas appliance connector at issue in this case is a flexible, stainless steel, corrugated line, correct?**

A Correct.

**Q And I know you refer to it as a gas appliance connector, but it's a flexible, stainless steel tube; is it not?**

A We do not refer to it as tubing. Tubing has a different connotation in our industry. We usually refer to tubes -- sometimes tubing can mean various either metallic or nonmetallic type of conveyance solutions for gas, so we -- the ANSI product standards that we go by clearly define our product as a gas appliance connector. And we do make gas appliance connectors to the ANSI product standards.

**Q I guess what I'm trying to get at is, this particular one was a corrugated, stainless steel, flex connector, correct?**

A Yes. The composition is stainless steel, and it is corrugated for flexibility.

**Q My question then is does Dormont manufacture other gas appliance connectors that are not corrugated, stainless steel units?**

A We do not.

**Q By example, does Dormont make any type of copper tubing or gas appliance connectors?**

A We do not.

**Q Only the stainless steel?**

A Correct.

**Q Is that the product that was being produced when you started in December of 1998?**

A That is correct.

**Q I will make an attempt to refer to it as a gas appliance connector. If there's any question what I'm referring to, please let me know, and I'll try to clarify.**

A Okay.

**Q When you started with Dormont in December of 1998, was the facility located where it is today?**

A Yes, it was.

**Q And where is that?**

A Export, Pennsylvania.

**Q Are these units, these gas appliance connectors, actually manufactured there in Pennsylvania?**

A Yes, they are.

**Q Are the units manufactured anywhere other than Export, Pennsylvania?**

A No.

**Q Are they sold under the name Dormont?**

A Yes.

**Q Are they sold under any other brand name?**

A Yes.

**Q What are those brand names?**

A For example, we private label for General Electric, Sears, used to be a company called H.D. Supply, but they no longer exist. I believe those are the only three that we actually private label for that would have a name other than Dormont on the gas connector.

**Q When did H.D. Supply go under?**

A I believe they were acquired by a company called Hajoca Corporation, and I believe that's been within the past two or three years. I'm not sure of the exact date.

**Q What was the name they merged with?**

A I believe the company that purchased H.D. Supply is called Hajoca, H-A-J-O-C-A, Corporation.

**Q And Dormont no longer sells units to H.D. Supply or Hajoca?**

A We do sell gas connectors to Hajoca. As of right now, they are not private labeled.

**Q It would still carry the Dormont label?**

A That is correct.

**Q Currently, in other words presently, what appliance manufacturers sell a Dormont gas appliance connector with its appliances?**

A I believe most of the -- we refer to them as appliance OEMs, which is Original Equipment Manufacturers. We do sell gas appliance connectors direct to appliance manufacturers. I believe the bulk of that exists in our hearth segment.

**Q I'm sorry, the what segment?**

A Hearth, H-E-A-R-T-H, hearth and gas logs, fireplaces, et cetera, products like that. So companies such as Hearth and Home Technologies, Lennox, R.H. Peterson, those would just be some examples of some of the major appliance OEMs within the hearth segment. I'm not sure that we sell gas appliance connectors directly to other appliance OEM

segments such as ranges or dryers or hot water tanks. I don't believe we sell gas appliance connectors directly to those appliance OEMs.

**Q Would that have been true from approximately 2005 to present?**

A Yes.

**Q That hasn't changed during that time frame is my question?**

A I do not believe so. I'm not recalling anybody either today or then that we sell gas appliance connectors direct to a segment other than the hearth and gas log.

**Q Does Dormont have any reason to believe that any of the appliance manufacturers buy those units indirectly and incorporate them in their retail product?**

A I don't believe that an appliance OEM would buy our product indirectly.

**Q That probably answers my question, but the appliance involved in this particular case was a Jenn-Air. I believe they are owned by Whirlpool, if I'm not mistaken. You're not aware of any business relationship between Dormont and Jenn-Air or Whirlpool between 2005 and the present?**

A The only business that I know of direct

with Whirlpool Corporation is we sell a gas appliance connector that is used on a stackable washer and dryer unit. It's actually on the gas dryer end of that. And that product is sold directly to Whirlpool.

**Q In connection with an oven or stove manufactured by Jenn-Air or Whirlpool, you're not familiar with any direct sales to Whirlpool or Jenn-Air for a stove or oven?**

A I'm not aware of any.

**Q Does Dormont have a position or an opinion as to whether or not the gas appliance connector involved in this litigation was manufactured by Dormont?**

A I'm sorry, could you repeat the question?

**Q The gas connector, appliance connector, involved in this particular litigation, does Dormont have a position regarding whether or not Dormont manufactured that particular gas appliance connector?**

A I believe from the pictures that I've seen of the product it appears to have the Dormont markings on the product.

**Q Would it be the position of Dormont that that gas appliance connector was not sold directly to the manufacturer of that appliance --**

A If Jenn-Air was the manufacturer --

(Court reporter clarification.)

MR. PIPES: I said appliance, and I should have finished, to which it was connected.

THE WITNESS: If Jenn-Air was the manufacturer of the range in question then I believe it would not have been sold directly to Jenn-Air.

BY MR. PIPES:

**Q Does Dormont sell that particular product to any large hardware or plumbing type retailers?**

A Yes.

**Q Which ones?**

A The Dormont gas appliance connectors are sold through different channels. One channel would be the retail outlets, so some of the big boxes such as Home Depot, Lowe's, Menards, retailers such as those. Our product is sold through that channel. Another channel would be through plumbing wholesale. I'm not as familiar with some of the names of plumbing wholesale as I am the big retailers, but I believe a company like Hajoca would be a plumbing wholesaler or a distributor within the United States. I think G.E. Derby is considered a distributor or wholesaler as well, but I'm not totally sure about that. But we have numerous plumbing wholesalers and distributors that we sell our Dormont gas appliance connectors to,

and then they would resell the product to plumbers or do-it-yourselfers at the retail level.

**Q You've already told me that Dormont, at least from 1998 until present, has not produced any gas appliance connectors other than the corrugated, stainless steel type that's involved in this litigation, correct?**

A Correct.

**Q And obviously, they come in different lengths, correct?**

A Correct.

**Q And perhaps different diameters as well?**

A Correct.

**Q Other than different lengths, different diameters, does Dormont sell any other products other than the gas appliance connectors?**

A Well, we sell gas appliance connectors also into the food service industry, but they are also called gas appliance connectors.

**Q Are they different in design than those involved with appliances?**

A They are different in design from residential appliances, yes.

**Q In what ways are they different?**

A They are manufactured and listed by CSA to

a different ANSI product standard than the gas appliance connectors we were previously talking about. They are still a base -- it's a flexible stainless steel connector, but some of the construction differences are for the food service industry. Like I said, it is certified to a different ANSI product standard, so there are different performance requirements of that. As such, the construction of the product is different.

**Q Do any of those standards or specifications involve resistance or protection from transient electricity?**

A No.

**Q Do any of the standards involving residential appliances involve resistance or protection from transient electricity?**

A No.

**Q And when I use the term, transient electricity, I'm using it in a broad sense to include, for example, lightning, appliance failure, any type of electrical surge or errant electrical discharge. Do you understand that?**

A Understood.

**Q And you mentioned CSA as the testing facility or organization, correct?**

A Yes.

**Q What does CSA stand for?**

A Canadian Standards Association.

**Q Are there any U.S. organizations that test or approve your product?**

A We use solely CSA for approval in the United States and Canada.

**Q Is there some sort of reciprocity between the U.S. and Canada regarding the CSA approval?**

A CSA is a third-party, listing agency that we use for product certification and approval for use of our product in the United States and Canada.

**Q Does the United States require such an approval?**

A The National Fuel Gas Code and the International Fuel Gas Code, as well as Uniform Plumbing Code, require -- or actually identify an ANSI listed gas appliance connector as a suitable means of installing a gas appliance.

**Q I understand that, but I guess my question is, is the stamp of approval, so to speak, from CSA a requirement to meet the standards in the United States for the sale of that product?**

A A certified product is a requirement. A manufacturer is not required to use CSA as the third-

party, listing agency. There are other third-party, listing agencies available to a manufacturer.

**Q What are some of those third-parties?**

A Underwriters Laboratories would be one of them, commonly referred to as UL. ETL, which I'm not actually sure what ETL stands for, but they are also a third-party, testing agency for products.

**Q Now, the American Gas Association, does that actually -- does that entity certify products as well?**

A They used to. My understanding is prior to right around 1998 or 1999 time frame that gas appliance connectors for sell in the United States, you could use AGA as the certifying agency. And then products for sell in Canada, as a manufacturer, you could use CGA, which was Canadian Gas Association. Since that time frame, which was right around 1998 or '99, that is when CSA -- they were known as CSA International at the time. Now I believe they are referred to as CSA Group. They were able to certify and list gas appliance connectors for use both in the United States and Canada because the ANSI product standard was harmonized at that time between the U.S. and Canada instead of there being two separate product standards.

**Q How long has Dormont been manufacturing the product involved in this litigation?**

A It was prior to 1998 with which I started with Dormont. I'm not sure of the exact year that Dormont started manufacturing this particular gas appliance connector. It was definitely prior to 1998.

**Q And I meant to ask that question more specifically. I've been told that the product involved in this particular litigation was a Model Number 30-3131-48. Would your answer be the same for that specific unit?**

A Correct.

**Q Can you tell me what the numbers in that model number mean, if anything?**

A Yes. The first two digits, which are 30, indicate the model of the connector, which is our 30 Series. Per the ANSI standard, that is equivalent of a half inch ID gas connector, or also commonly referred to as a five-eighths inch OD gas connector. The middle four digits, the dash 3131, signify the type of flare adaptor that would be sold with the gas appliance connector attached at both ends of the connector. So the first 31 refers to a half inch male pipe thread connector that also has a three-eighths inch female pipe connector as well. And then the

other end is also a 31, so this particular connector on both ends was provided with a half inch male pipe as well as a three-eighths inch female pipe connection. And then the -- I'm sorry, go ahead.

**Q Which number goes first; male then female?**

A No, it really doesn't matter in this case. I think in general the male usually goes first. Like for example, a 3132 would be one half inch male on one end, and it would be one half inch female on the other end.

**Q What would the difference be in a Model Number 30-3131 -- well, the 48, I never got a -- I forgot to ask you what the 48 meant. Is that the length?**

A That is correct. That is the overall length of the finished gas connector assembly from end to end.

**Q My next question was, what would be the B signify in a Model Number 30-3131-48B?**

A Any suffix after the overall length would just indicate a packaging adder. So for example, a B, as in boy, would just mean that the product is bagged. So it would be coiled and put into a retail bag for sell to our customer.

**Q How many suffixes come with this**

**particular unit?**

A I believe B is one of them. I believe we also have a BX, which would mean a boxed, an individually boxed connector instead of bag. I believe we also have some numerical digits as suffixes after the overall length for specific customers. Like for example, when we private label for somebody such as GE like we talked about, their part number might have a dash -- for example, like a dash 069 or something for -- as an example, that would indicate that it is specific for a manufacturer like GE. Therefore, we would know to use the correct packaging for that private labeled product.

**Q If this particular -- I'm sorry. Is the entire model number stamped on the unit anywhere?**

A The entire model number is not.

**Q Is it put on a label on the unit somewhere?**

A Per the ANSI product standards, we permanently mark information on what we call the skirt of the flare nut. So if you look, both ends of the gas appliance connector have a permanently attached flare nut, and on that flare nut are permanent markings that are required by the ANSI product standard. On this particular model, you would see a

0.50 inch stamping on the flare nut skirt, which would indicate that it's a half inch ID gas connector, which would be equivalent to the Dormont 30 Series product.

**Q Looking at the product after the fire, there's no way of telling whether or not this had any type of suffix related to how it was packaged or whether it was related to a private label; is that correct?**

A That would be correct.

**Q Is the product made for any of your private labels, GE and otherwise, any different than those that are not?**

A They are no different other than labeling and packaging.

**Q Can you tell me what labels and instruction warnings, et cetera, come with the various units, whether they're bagged or boxed?**

A Yes. We are required by the ANSI product standard to provide our product with a fixed label, so we use what we call a wrap-around flag label that is attached to every gas connector that we sell regardless of packaging. And that wrap-around flag label contains lots of information, product warnings, product installation instruction, there's a flow capacity chart on there for the various diameters of

gas appliance connectors. We also display on the label the various ANSI, slash, CSA product standards that the product is listed to, as well as the CSA logo indicating approval and certification by CSA. There is also the Dormont information on there, as far as the Dormont name, logo and address as well. So yes, there's -- regardless of how we sell the product, whether it's through retail or plumbing wholesale, and regardless of the packaging, this wrap-around flag label is applied to every Dormont gas appliance connector that we manufacture and ship out.

**Q Are any of the units sold in a manner that is neither bagged nor boxed individually?**

A Yes. Primarily through plumbing wholesale, we provide the gas connectors in bulk quantities, so we would basically package a predefined number of gas appliance connectors in a box and send that box of gas connectors to the customer in bulk quantities.

**Q Are there any instructions or warnings that are contained on the tag that you said is attached to every product that is not on the bagged or boxed?**

A Yes. We do not, on individually bagged product -- when a gas appliance connector is packaged

in a bag for retail sell, we also drop into that bag a trilingual installation and warning instruction guide, in addition to the wrap-around flag label that's already present on the gas appliance connector.

**Q And I think I asked that in reverse. What I meant to ask you was, in those units that are bagged or boxed that would contain this additional trilingual instruction or warning document, is there anything on those included -- those documents included in the bag or box that are not already on the tag?**

A I don't believe so.

**Q Do you understand my question? It was poorly worded.**

A Go ahead and say it one more time for me.

MR. LASKEY: I guess I'll object to the form of the question since you're objecting to it yourself, and that it would take a line-by-line comparison of the two to be certain. But if you have knowledge, you can answer.

BY MR. PIPES:

**Q Sure. Mike, what I'm trying to find out is some units have -- all units have a tag on it with instructions and certain warnings, correct?**

A That is correct.

**Q And then some units that have that tag are**

**individually bagged or boxed, correct?**

A That is correct.

**Q And if it's individually bagged or boxed, in addition to the tag that is physically attached to the unit, there's a separate piece of paper that involves trilingual instructions and warnings, correct?**

A That is correct.

**Q My question is, are there any warnings or instructions that are in the document provided with the bagged or boxed units that is not already on the tag itself physically attached to the unit?**

A Nothing additional to my knowledge.

**Q Is the tag physically attached to the unit trilingual as well?**

A It is not.

**Q So it would be different in that sense, correct?**

A In product -- gas appliance connectors that are sold within the United States just have a single English flag label on them. For product that we sell directly into Canada, I believe there is also a French equivalent of that label.

**Q Would it be one or the other? In other words, if it's sold in Canada it comes with a French**

**label, if it's sold in the U.S. it comes with an English?**

A I believe the ones in Canada are sold with both English and French.

**Q Well, to cut to the chase, would it be accurate to say that none of the instructions or warnings, whether they be physically attached to the Dormont appliance connector or provided in the bag or the box, have anything to do with bonding?**

A I do not believe that the word, bonding, appears in any of those instructions.

**Q Are you familiar with the term, bonding, and its meaning?**

A Yes, I believe I am.

**Q Well, when you say in your response that the word, bonding, is not used, are there any instructions or warnings that relate to bonding?**

A Well, we do reference that the gas appliance connector is not to be used as the appliance ground. I think that's probably as close as we come to anything related to that topic.

**Q My next question was going to be, is it accurate to say that there are no warnings or instructions associated with this product, whether it be physically attached or contained in a box or bag,**

**dealing with grounding?**

A Other than the statement that the gas appliance connector should not be used as the appliance ground.

**Q Is there any instruction or warning associated with the product that states that the appliance connector itself should be grounded?**

A There is not.

**Q Does Dormont have a position as to whether or not its product should or should not be grounded?**

A We follow the ANSI product standard, as well as the references in the National and International Fuel Gas Codes that our product is not required to be bonded and/or grounded.

**Q Do you know if Dormont has ever performed any research, investigation or testing as to whether or not grounding of its product would make it safer?**

A To my knowledge, we have not.

**Q Same question in connection with bonding?**

A My response would be the same. To my knowledge, we have not.

**Q We mentioned a moment ago competitors. Can you tell me who are the main competitors of Dormont in the manufacture and sell of gas appliance connectors?**

A Yes. Specifically for -- I assume we're referring to stationary gas appliance connectors in the residential market. Our main competitor is a company called Brass Craft. And I believe they are owned by a company called Masco.

**Q How do you spell that?**

A Brass Craft is B-R-A-S-S, C-R-A-F-T. And their parent company is Masco, M-A-S-C-O. And they're our -- go ahead.

**Q I'm sorry, I interrupted you. Go ahead.**

A I was just going to say, there are some other smaller competitors as well, a company called Mueller. And I'm not sure if Mueller actually manufactures their own gas appliance connectors or if they are a reseller. There are quite a few manufacturers of gas appliance connectors outside of the U.S., specifically in the Asia area, that have their product sold into the U.S. and Canada through a reseller under various brand names.

**Q What would those various brand names be?**

A There's a company called, USD, which I'm not sure what USD stands for.

**Q D as in dog?**

A Yes. There's a company called Duratrac, D-U-R-A-T-R-A-C. I believe that both of those

competitors in the U.S. -- I believe they import their product from the Asia area and basically have it listed and labeled under their name. I don't believe they're the actual manufacturer of the product.

**Q Do you know whether or not those products, USD or -- compliant?**

**(Court reporter clarification.)**

BY MR. PIPES:

**Q My question was, do you know if USD and/or Duratrac is ANSI compliant?**

A I believe they are listed by CSA to those ANSI product standards.

**Q Does Dormont have any type of research and development or testing department that looks at competitor products?**

A We are aware of our competitors' products, and we have from time to time had competitors' products brought in for review.

**Q Is Dormont aware of any litigation involving Brass Craft, Mueller, USD, or Duratrac in connection with fires related to failures associated with transient electricity?**

A I am not aware of those.

**Q Is Dormont aware of any design, significant design characteristic or differences**

**between its product and Brass Craft?**

A I can't really speak to the detail design parameters of the Brass Craft product. I'm not aware of any real significant differences. We are both listed to the same ANSI product standards by CSA.

**Q Do you know if Brass Craft's product is more or less expensive than Dormont's?**

A I do not know that.

**Q Do you know if Brass Craft has a larger or smaller market than Dormont?**

A If you're referring to market share, I believe that Brass Craft has a larger market share of the stationary, what we call the residential gas appliance connector market?

**Q Could you estimate for me the market share of Brass Craft versus Dormont?**

A Yeah. I believe we estimate that Dormont has -- excuse me, I believe that Brass Craft has somewhere in the neighborhood of 60 percent of that market share, whereas Dormont is probably in the range of 35 to 40 percent of that market share. And then we believe that usually in the noise of that 5 to 10 percent range of the market would be all of those other remaining players combined.

**Q How did you spell Mueller?**

A Mueller, I believe, is spelled M-U-E-L-L-E-R.

**Q Is that a German company?**

A I do not know.

**Q But you would estimate that between Mueller, USD and Duratrac, those three companies, as well as perhaps some others, only make up less than 5 percent of the market?**

A I believe they're probably somewhere between 5 or 10 percent at the most.

**Q Do you know if any of the competitors, of Dormont's competitors, instruct or warn regarding bonding or grounding?**

A I do not believe that they do.

**Q Does Dormont instruct or warn about any particular safety hazard or issue that would not be required by ANSI?**

A I believe that some of our warnings -- at the very least, our product warnings are everything that is required by the ANSI product standard. I would have to do a direct side-by-side comparison to see what warnings we also call out that are above and beyond anything in the product standards.

**Q And that's my question. As we sit here today, are you aware of any warnings that go beyond**

**the minimum compliance with ANSI?**

A I'm sure that there are. I'm not sure exactly which ones of all of the product warnings that we put on the label are above and beyond those product standards, but I'm sure there are some additional ones.

**Q And it was my intent to limit that question to the residential gas connector line.**

A Okay.

**Q Your answer would be the same?**

A Yes.

**Q How many units of the stainless, corrugated stainless steel gas connector lines does Dormont sell? Obviously, this was a 48 inch. How many different models are there?**

A On the residential side, which is the stationary gas appliances for residential use, we sell roughly about 4 Million gas connectors per year into that market across multiple sizes.

**Q And what sizes are those; what's the range?**

A Sure. We have a Dormont 10, 20, 30, and 40 Series products. The Dormont 10 Series is a quarter inch ID gas connector. The Dormont 20 Series product is a three-eighths ID gas connector. The

Dormont 30 series product is the half inch ID gas connector. And a Dormont 40 Series product is a three quarter inch ID gas connector. Those are primarily the four sizes that we would sell into the residential stationary gas appliance market.

**Q And all of those refer to the inner diameter. I would assume that each series has its particular lengths that it comes in?**

A Yes. Correct. Every series would have multiple lengths that it's available in, anywhere from 12 inches up to 72 inches in final length, as well as various end fitting configurations based on the pipe thread size for the application.

**Q Earlier you mentioned that there was a connotation that Dormont didn't agree with, as far as referring to its product as tubing, for example, the common term corrugated stainless steel tubing, CSST. What is the distinction between the corrugated stainless steel flex lines that Dormont sells, the appliance connectors, and what's commonly referred to as CSST?**

A The differences are multiple from my understanding. I'll clarify first by saying that Dormont does not manufacture or sell or design CSST product lines, so I'm not intimately familiar with all

of the details of the CSST product line as defined. Some of the major differences that I'm aware of is that Dormont gas appliance connectors have a completely different ANSI, slash, CSA product standard that they are listed and certified to as opposed to CSST. CSST has its own ANSI, slash, CSA product standard that it is listed and certified to.

**Q I understand that. But as far as a physical design or composition difference, I'm more interested in that. If I were to take a 72-inch piece of Dormont Series 40, 72-inch Dormont gas connector, and I were to take a 72-inch piece of CSST, what would the difference be in those two products?**

A I'm not sure that I can really speak to those differences because I'm not intimately familiar with the design of the corrugated stainless steel tubing product.

**Q Who at Dormont would be able to answer those questions for you?**

A I'm not sure that anybody at Dormont would be able to speak to the detail design of CSST since we do not manufacture or sell it.

**Q And what I want to find out is not simply the manner of semantics, what we call these products. I want to know the difference physically in what is**

**referred to as CSST and Dormont's product. Do you understand that?**

MR. LASKEY: Object to the form.

BY MR. PIPES:

**Q Mike, do you understand the question?**

A I do.

MR. LASKEY: We also have our discovery responses which give a long laundry list to the best of Dormont's knowledge of differences. But like we said in the discovery response, we don't manufacture CSST, so we can't purport to be an expert on it.

MR. PIPES: Well, someone obviously provided those answers that were supplied to the discovery, written discovery. If that was not Mike, I want to know who or what individual or individuals supplied that information.

MR. LASKEY: Well, that was Mike.

MR. PIPES: Those are one of the things that I need to cover today.

MR. LASKEY: Sure. That was Mike working with me and literally having the code books to which we refer open and looking for differences.

THE WITNESS: I don't believe we documented anywhere in there any differences between product design characteristics of CSST versus a gas

connector. It was more around the ANSI product standards, the National Fuel Gas Code, the International Fuel Gas Code, the lengths that they're sold in, how they're sold to the market. We did not define any differences from a pure product design or dimensional standpoint.

**Q And that's really what I want to get to, not the testing that it's subjected to, not the standards or whatnot, but actually the physical design characteristics. You're not aware of any?**

MR. LASKEY: Mike, why don't you take a moment to review the answer that we gave. Hey, Randy?

MR. PIPES: Yes.

MR. LASKEY: While he's looking at that, who is with you in the room there? I think they need to be listed on the transcript.

MR. PIPES: I'm sorry. Blaine Aydell is here with me.

THE WITNESS: One of the things of note in our responses were I say that end fittings are different for CSST as opposed to gas appliance connectors, so that would be related to construction of the product. Gas appliance connectors are manufactured with flared fittings on the end which is comprised of a flare nut and a flare adaptor, and we

flare the ends of those gas appliance connectors out to a 45-degree angle. That, to my understanding, is different from the end fittings and connections made on CSST product. I believe those end fittings are terminated in the field by the installer, and I believe there are various different constructions and methods depending on manufacturer of how that's done. I believe the CSST is cut to length in the field, and depending on the manufacturer's install instructions and the design of their end fittings that those end fittings can be attached in various different manners to the CSST. Whereas our product, Dormont gas appliance connectors, leaves our facility with the end fittings already attached to the product, and it's a predefined 45-degree flare seal.

MR. PIPES: Okay.

THE WITNESS: I also believe that flow capacity ratings are treated differently for CSST as opposed to gas appliance connectors, being the fact that gas appliance connectors can only be sold in lengths up to six foot or less, and they have to be fully assembled when they leave our facility, whereas CSST manufacturers sell their product in spool form up to hundreds of feet in length. So I believe that their install instructions have to account for flow

capacities and pressure drops of much longer lengths and different diameters than what our product addresses.

I also know that CSST is required to have an external coating on the product. I believe there is a yellow coated CSST product that's available for sell on the market. I don't know what the composition of that yellow coating is. And I believe there are also black coated CSST products on the market today as well. And once again, I'm not familiar with what the composition of that black coating is either. But that's different from a gas appliance connector. A gas appliance connector is not required to have any external coating over top of the product. It would be at the manufacturer's discretion as far as whether or not they wanted to apply a nonmetallic exterior coating to the gas appliance connector.

I believe also that the corrugated profile of CSST is different than that of a gas appliance connector. From my understanding, a gas appliance connector is manufactured with a corrugated profile that allows for more, quote/unquote, flexibility of the product, being that a gas appliance connector can be hooked up to a stationary gas appliance but one that can be moved after installation such as a

residential gas range or gas dryer. Whereas, I believe the CSST manufacturers, as well as that product standard, do not allow their product to be hooked up to an appliance that can be moved after installation. I believe they warn against hooking up CSST to a residential gas range or gas dryer because the CSST corrugated profile is stiffer and less flexible and not to be moved at all after installation.

I also believe that CSST is manufactured with what we define as an annular corrugated profile, as opposed to gas appliance connectors which are manufactured with a helical corrugated profile. I believe the reason that CSST manufacturers use an annular corrugated profile is because their tubing -- or I'm sorry, their CSST product is manufactured in long lengths and sold to the field in real form, so that an installer has to cut it to length and terminate in the field. I believe that the only way to do that in the field is to have an annular corrugated profile. I'm not sure how you would cut and terminate helical corrugated tubing in the field and apply an end fitting to it.

I also believe that the performance requirements for CSST from a flexibility standpoint

are less stringent than that of gas appliance connector due to the installation of the product. Like I had referred to, a gas appliance connector can be hooked up to a product such as a gas range or gas dryer that can be moved by a homeowner after installation. So some of the performance requirements of a gas appliance connector are based on that, and I believe are, therefore, different than perhaps what the CSST product standard is required for their product line. So from a design and product performance standpoint, those are the differences that I'm aware of between gas appliance connectors and the CSST product line.

BY MR. PIPES:

**Q Help me with the annular versus helical. Explain that to me.**

A Sure. An annular corrugated product is one where every corrugation is an individual corrugation, okay. It's formed individually and it's independent on its own. A helically corrugated profile is very much like a screw, for example. If you traced your finger along the path of a helical corrugated product, that corrugation is continuous along the length of the product. It's not individual corrugation, so it's much like a screw pattern if you

will.

**Q Are you aware of any design differences between the two that would relate to a difference in how either product would react to stray current or an electrical anomaly?**

A I am not aware of how a gas appliance connector or a CSST reacts to that condition.

**Q You're not aware of Dormont ever performing any test of its product, its gas appliance connectors, as to how it would react to errant electricity?**

A That is correct.

**Q Specifically, has Dormont ever researched, tested or investigated how its product reacts or responds to electrical arcing?**

A Not to my knowledge.

**Q Do you know the purpose of the yellow or black coating you just referenced on some of the CSST products?**

A I'm not aware of the design, intent or purpose of the yellow or black coating of the CSST product in detail. From what I've heard, I believe the black coating is meant to be some form of, quote/unquote, lightning protection for their system. I'm not quite sure how it works or if it really does

that or really any details about it.

**Q Do you know if Dormont has ever attempted to design an alternative design to its gas appliance connectors that would provide some type of protection from transient electricity?**

A Not to my knowledge.

**Q Are you aware of any difference between CSST and Dormont's products regarding wall thickness?**

A I can't speak directly to the wall thickness requirements for CSST. I'm not sure what they are.

**Q Do you know if there's any difference in the type of stainless steel used in the Dormont product versus CSST?**

A As well, I can only speak to the type of stainless steel that we use on gas appliance connectors. I'm not quite familiar with the grade or type of stainless steel that is used on CSST.

**Q What grade of stainless is used by Dormont?**

A The product standard requires that we use an austenitic grade of stainless steel. Dormont chooses to use a 304 stainless steel for our product.

**Q You mentioned also that you believe the gas appliance connectors manufactured by Dormont may**

**be more flexible than the CSST; is that correct?**

A I believe so, yes.

**Q And what design characteristic makes that --**

A I believe the corrugated profile would lend a gas appliance connector to be more flexible than the CSST product, as well as I also believe there are performance requirements within the CSST product standard that are less stringent from a flexibility standpoint than that of a gas appliance connector.

**Q You were talking about the difference in the profile between the CSST and the Dormont gas connector. And that again goes back to the annular versus helical; does it not?**

A That would be part of it, yes.

**Q What functional purpose does that difference serve, if any?**

A Are you referring to annular versus helical?

**Q Yes.**

A I'm not aware of any functional differences in and of itself from a product performance standpoint of annular versus helical.

**Q Well, does it result in any differences in the two products?**

A I do not know that in and of itself an annular versus a helical profile with all other things being equal result in any performance difference.

**Q Do you know if any of your competitors, Brass Craft, Mueller, any of the competitors use annular rather than helical in their design?**

A I believe that those gas appliance connector manufacturers use helical tubing, helical gas connectors.

**Q Does Dormont make all of its component parts that comprise a gas connector?**

A We do not.

**Q What components are purchased by Dormont?**

A Dormont purchases the flare nuts as well as the flare adaptors as well as a gas valve if provided with one.

**Q Is Dormont aware of any potential design alternatives that incorporate either bonding or grounding to the product?**

A I am not aware of such design options available in the market for a gas appliance connector.

**Q You said I. Is that you personally or Dormont?**

A I'm speaking on behalf of Dormont.

**Q Okay. Dormont is not aware of any**

**alternative designs that might add any safety features to the product?**

A What do you mean by available designs?

MR. LASKEY: Are you talking about now?

MR. PIPES: Any other alternative designs available for use, either for purchase or patent purposes, that Dormont could use that would add some safety feature to its product.

MR. LASKEY: Are you talking about currently or back in 2006 when this one was manufactured?

MR. PIPES: Good point. Let's talk about currently.

THE WITNESS: I am aware, and I believe there are patents that have been published that are an attempt to address bonding or grounding as it relates to either CSST or a gas appliance connector. I'm not aware of any validity that those potential product designs as defined by the patent actually have in applications or not.

BY MR. PIPES:

**Q I'm sorry, have in applications or what?**

A Have in real life applications. So I'm not sure if what's actually depicted or defined in those patents actually works how they say it's going

to work.

**Q Is Dormont interested in finding out whether or not it would work as advertised?**

A We have done nothing --

MR. LASKEY: Object to the form and beyond the scope. You can answer.

THE WITNESS: We have done nothing to explore any alternative designs as far as implementing them on our product.

BY MR. PIPES:

**Q Has Dormont monitored in any way the litigation ongoing against CSST regarding bonding and grounding issues?**

MR. LASKEY: Objection. Beyond the scope. You can answer.

THE WITNESS: I believe that Dormont is aware there is litigation that either has happened in the past or is currently going on relative to the CSST product line.

BY MR. PIPES:

**Q Is Dormont aware of any litigation involving Brass Craft appliance -- gas appliance connectors?**

A I do not believe that we are relative to Brass Craft.

**Q Has Dormont been involved in any claims or lawsuits involving failure of its gas appliance connectors due to some type of electrical anomaly?**

MR. LASKEY: Object to the form. Compound.

MR. PIPES: Other than the one that we have here today.

MR. LASKEY: So you said claims and you said lawsuits. I would suggest you break those up.

MR. PIPES: Sure.

BY MR. PIPES:

**Q Let's talk about claims. Are you aware of any claims made against Dormont involving its product's failure, gas appliance connector's failure, due to some type of electrical anomaly?**

MR. LASKEY: And let me make a general objection that there's a difference between a claim and being put on notice of a potential claim in the gas, fire and explosion world, but you can -- if there's any actual claims that you're aware of that you can state.

THE WITNESS: I believe that we have been put on notice of events where a Dormont gas appliance connector has been involved in such a condition. I'm not sure that I'm aware that we have any claims that

are open relative to that condition.

MR. LASKEY: If you go to lawsuits, there is one other lawsuit, and he'll give you his knowledge about that if you would like.

BY MR. PIPES:

**Q Okay. Let's stick with claims for a moment and notice. On how many occasions has Dormont been put on notice of any type that perhaps its product failed due to some electrical phenomenon or anomaly?**

A I would say in a given year's time period, we are put on notice for various reasons maybe between two and five times. I'm not sure how many of those are related to electrical conditions.

**Q Would those claims generally be related to fires?**

A They could be.

**Q If we accept the two to five per year, how many of those two to five would be -- would involve fires?**

A This would be a guess on my part. I'm not totally sure what the exact number would be. I'd probably believe probably at least half of them would be where there was some loss or incident involved.

**Q What individual or department at Dormont**

**is set up to handle these type notices or claims?**

A Steve Ramer is the individual that handles our product liability notifications when they come into Dormont.

**Q How do you spell Ramer?**

A R-A-M-E-R.

**Q And what is his position at Dormont?**

A He is the manager of environmental health and safety as well as product liability.

**Q Do you know how long Mr. Ramer has held that position?**

A The environmental health and safety or product liability?

**Q Well, let's break it down. How long has he been manager of environmental health and safety?**

A He was hired at Dormont in that capacity. I believe that Steve has been with us for, I would say, eight to ten years, I believe, in that range. I'm not sure of his exact date of hire.

**Q And then I guess some type of job description was added to that title, product liability?**

A Yeah. He took over responsibility of product liability, I'm guessing, in the last four or five years. Once again, I'm not sure to the exact

date of when that was added to his responsibilities.

**Q Was there an individual that had those responsibilities, product liability, before Mr. Ramer took them over?**

A Yes.

**Q And who was that?**

A His name was Bryan, B-R-Y-A-N, Popp, P-O-P-P.

**Q How long was Mr. Popp in that position?**

A I'm going to say three to four years, I believe.

**Q And when did he leave Dormont?**

A I believe he left Dormont in -- it was the 2007/2008 time frame.

**Q Do you know where Mr. Popp is employed at this time?**

A Not 100 percent sure. The last I heard he was with Westinghouse, but I'm not sure if that's true anymore or not.

**Q Did he leave the Export, Pennsylvania area?**

A I believe the division of Westinghouse that he went to was located in Cranberry, Pennsylvania, which is just north of Pittsburgh.

**Q You mentioned several times the ANSI**

**standards that CSA tests your products to. Are there any other codes or requirements applicable to these gas appliance connectors?**

A I don't believe so. I believe there are just the two ANSI product standards that the gas appliance connectors are listed to.

**Q Are you familiar with the specific ANSI standards?**

A Yes.

**Q What are those ANSI standards?**

A The first one is ANSI Z 21.24, backslash, CSA 6.10.

**Q What does that standard pertain to?**

A That is for connectors for gas appliances.

**Q All right. What other standards?**

A The other one would be ANSI Z 21.75, backslash, CSA 6.27.

**Q And what is its title?**

A That is connectors for outdoor gas appliances and manufactured homes.

**Q Any other standards?**

A I believe those are the only two product standards that it would be listed to.

**Q What other general standards are**

**applicable, if any?**

A None that I'm aware of.

**Q Throughout the deposition, I have noticed that you stated, stationary, several times. And there's a difference between Dormont's products that are utilized or sold for purpose of stationary appliances versus nonstationary; is that correct?**

A Yeah. We would refer to those as movable, the nonstationary.

**Q Moveable would be for what, RVs, mobile homes?**

A No, sir. That would be for our food service market, so that would be appliances that are generally on casters in a food service environment. That's what we categorize as a moveable gas appliance.

**Q And I think I've already asked you, you're not aware of any differences in the ANSI specifications that pertain to bonding or grounding or some type of an electrical protection between those two types of appliances?**

MR. LASKEY: Object to the form.

THE WITNESS: I do not believe there is any reference to bonding or grounding in any of those ANSI product standards.

BY MR. PIPES:

**Q Can you tell me some of the main differences that you're aware of for manufacturing specifications between those two, the moveable and nonmoveable?**

A Well, the moveable gas appliance connectors are a different ANSI product standard. That's ANSI Z 21.69. So the ANSI product standard captures different product performance requirements for the moveable gas appliance connector, as opposed to the stationary.

**Q Right. And I was just asking for some very general differences, the major differences between the two. Is it wall thickness, is it length? What are some of the differences?**

A Really some of the main differences are the product performance testing section of those ANSI product standards. Like for example, the moveable gas connector standard has a test that's called tension and flexure, which is meant to represent a gas appliance connector that's under a moveable application, whereas opposed that tension and flexure test is not represented in the stationary gas appliance product standard. So that would be one main difference.

Relatively speaking from a construction

standpoint, they're very similar. From a diameter standpoint, the moveable gas appliance connectors that we sell in the food service are larger diameter. Generally, we sell three-quarter-inch ID, one-inch ID, inch-and-a-quarter ID into moveable food service applications because the equipment -- the gas appliances are larger and have a larger gas capacity demand than that of a residential stationary gas appliance. So we basically have larger diameters to cover that market as opposed to residential stationary.

**Q I forgot to follow-up. You told me about the claim or notices. Tell me about actual litigation lawsuits involving Dormont with the allegation that the product -- the gas connector failed as a result of some electrical anomaly?**

A We had, I believe it's a 30 Series product, half-inch ID --

THE WITNESS: Do I say the name of the case?

MR. LASKEY: Sure.

THE WITNESS: The case is Dougherty versus Dormont. Actually, there were three Dormont 30 Series gas appliance connectors involved. They were basically ganged together. They were attached to one

another to create a very long daisy chain of gas connectors, which would be contrary to our installation instructions. They were used to install a -- I believe it was a gas fireplace or gas log set. I'm not sure which one. But these gas connectors were daisy chained together and were touching one another and, I believe, were involved with a lightning incident that caused a gas failure.

BY MR. PIPES:

**Q Are you familiar with the type of gas failure?**

A Yeah. I believe that one of the 30 Series gas connectors involved in this daisy chain of gas connectors had a hole in it due to the lightning.

**Q Did Dormont perform any test or investigation to determine whether the daisy chaining or connecting end to end of the multiple units made that more or less likely to occur?**

A We would not have done any testing relative to that scenario.

**Q With the concession or understanding that the product is not made to connect end to end with each other, my question is in that litigation, did that process have any causal relationship or role in the failure of one of the lines itself?**

MR. LASKEY: Object to the form. And I'm going to instruct him not to answer. That's asking for an expert opinion, and it's also beyond the scope.

BY MR. PIPES:

**Q Is that litigation still pending?**

A Yes.

**Q The Dougherty lawsuit is still pending?**

A I believe so, yes.

**Q And where is it pending?**

A I do not know.

MR. LASKEY: Do you want me to tell you?

THE WITNESS: Brook knows.

MR. LASKEY: I'll tell you if you'd like. It's in Missouri in state court.

THE WITNESS: Yes.

MR. PIPES: Do you know the county?

MR. LASKEY: I don't, but I could tell you.

MR. PIPES: Okay. Thank you.

MR. LASKEY: Warren, W-A-R-R-E-N, County, Missouri.

MR. PIPES: Thank you, Brook.

MR. LASKEY: Sure.

BY MR. PIPES:

**Q To your knowledge, Dormont has not**

**performed or requested any outside party to perform any testing in connection with that lawsuit?**

MR. LASKEY: Object to the form. Asks for attorney/client privilege, and I will instruct him not to answer.

BY MR. PIPES:

**Q In connection with this litigation, you're not aware of any testing performed by Dormont or for Dormont regarding an electrical stray current or anomalies and the potential failure with its product?**

MR. LASKEY: You can answer that to the best of your knowledge.

THE WITNESS: I'm not aware of any, no.

BY MR. PIPES:

**Q Is there some individual at Dormont that is tasked with communications with some regulatory agency whether it's UL or CSA?**

A Yes. That would be me.

**Q That's you?**

A Yes.

**Q Okay. And if we needed any documents pertaining to the testing and compliance history of the products, those records are kept by you?**

A Yes, sir.

**Q In connection with this litigation, do you**

**know if Dormont has a position or opinion regarding the cause of the hole in the appliance connector gas line?**

MR. LASKEY: Object to the form. Calls for an expert opinion and is beyond the scope of the Rule 30(b)6 deposition. And I'm going to instruct him not to answer.

MR. PIPES: Okay. On that one, I would like to discuss it with you. I think that it is within the scope in that one of the areas of inquiry was the investigation related to this particular failure. And my question is not so much for his opinion or anyone's opinion. I want to know if Dormont has taken a position as to the cause of this failure. It doesn't matter to me whether it's opinion or not or what it's based on. Do you understand my question?

MR. LASKEY: Yeah. The problem is Dormont nor anyone from Dormont hasn't been involved in the evidence, examination, or the laboratory testing, which we still have probably three days of lab work ahead of us. So I'm not sure whether Dormont is prepared to give that opinion as of this point. No one from Dormont has had an opportunity to inspect the evidence in person or even look at any microscopic or

metallurgical work done on the product. So I guess with that being said, I'm happy to let Mr. Angus answer. Sure. He can answer to the best of his knowledge based on what he's seen in the photographs, I guess.

THE WITNESS: I mean, I'm not aware of anybody at Dormont, including myself, that has formulated an opinion on this specific litigation relative to the cause of failure other than the fact that we know we dutifully warn against daisy chaining gas appliance connectors together.

MR. LASKEY: Are we talking about this State Farm case in Louisiana or the Dougherty case?

MR. PIPES: I'm sorry, we're talking about this particular case not the Dougherty.

THE WITNESS: My apologies. Sorry about that.

MR. LASKEY: So what he's saying is, has Dormont formed an opinion as to the cause of the loss here. Or maybe you're asking what was the cause of the hole. We're not going to dispute there's a hole in our gas connector. I think what you're asking is why is the hole there?

MR. PIPES: Yes.

BY MR. PIPES:

**Q Has it taken a position or even made an assumption in connection with its investigation or research as to what caused that hole?**

A I don't believe that anybody at Dormont has an official position on it. My assumption would be that something arced to that gas appliance connector and caused a hole in it.

**Q There's been a lot of discussion about what Dormont has or has not done, and I want to make sure that I have a clear understanding of what's been done on its behalf if it hasn't done it itself. So I have the names of Chuck Keith and Richard Hoffman that we mentioned earlier. Are you familiar with those two individuals?**

A I do not know who Chuck is. I am vaguely familiar with who Richard Hoffman is.

**Q Have you provided any product information to Mr. Hoffman?**

MR. LASKEY: And I guess you're asking has Dormont directly provided that to Mr. Hoffman?

MR. PIPES: Correct.

MR. LASKEY: You can answer.

THE WITNESS: I don't believe that Dormont has provided that information to Mr. Hoffman.

BY MR. PIPES:

**Q Do you know if Dormont has provided information regarding its product or its product history to any outside parties in connection with this lawsuit?**

MR. LASKEY: Again, that's speaking to whether Dormont has provided that not whether it's lawyer has, but you can answer.

THE WITNESS: Dormont has not. I do not believe we have.

MR. PIPES: All right. If you'll just give us a moment, I might be pretty close to being done.

MR. LASKEY: Why don't we take five minutes, if that's okay with you.

MR. PIPES: That would be great.

(Recess.)

BY MR. PIPES:

**Q Mike, I asked you earlier if you were aware of any alternative designs, and your counsel correctly pointed out whether I meant at any time or today, and I said today, and we discussed a potential patent that's out there. In 2005, 2006 time frame, was Dormont aware of any alternative design for its product that might pertain to grounding or bonding?**

A I believe -- I do not believe at that time

we did. I believe that patent was first issued sometime in 2005, if I recall correctly just from looking back at it. I'm not sure that at the time we were aware of that, no.

**Q And I believe you told me that the design of the gas appliance connector at issue has not changed since you came on with Dormont in 1998?**

A We have had a few design changes relative to the gas appliance connector, yes.

**Q And what are those changes?**

A We are certified and listed to use either brass or plated steel flare nuts in our product design. So there was a time period, I believe up through mid 2007, that we used a brass flare nut. And since that mid 2007 time frame, we have been using a plated steel material flare nut.

**Q What prompted the decision to make the change?**

A Cost reasons.

**Q Any other design changes?**

A The only other design change was more of what I consider a process change. We developed a process called intermittent corrugation that allowed us to eliminate a downstream operation by which we -- we would cut to length our gas appliance connector and

swage the ends of our tube to a specified diameter, so that we could then flare that diameter out to a 45-degree angle and capture the flare nut on the end. We developed a propriety piece of equipment called intermittent corrugation that allowed us to eliminate that swaging operation by putting that straight length diameter of tubing into our corrugation process, which means that we didn't have to swage downstream as a secondary operation. We were able to flare that diameter out, you know, as processed during our corrugation process to allow us to flare the 45 degrees and attach our flare nut.

**Q When was that done?**

A That was done in -- I believe it was the 2003 time frame.

**Q And of course, that's a change to the process but not necessarily the design itself, correct?**

A Yeah. It just basically -- it was a major change to the process. It changed one feature of the product design, which was the end of the tube diameter that goes into the flare nut and gets flared out. The intermittent corrugated process required that diameter to be slightly larger than it was in the past, thus creating for just a little larger flare diameter to go

inside the flare nut. But the flare nut, in and of itself from a thread size and 45-degree angle and everything like that, didn't change. It was just really the diameter of the tube -- of the gas connector that went inside the flare nut that got upsized a little bit.

**Q Does Dormont produce any products that are either grounded or bonded?**

A No.

**Q And that would be currently, correct?**

A That is correct.

**Q At any time, has Dormont produced a product that is either bonded or grounded?**

A I do not believe so.

MR. PIPES: I think that's all the questions that I have. I appreciate your time.

MR. LASKEY: I may have one question. Let me step outside with Mike for a second to see if we need to clarify one thing.

MR. PIPES: All right.

THE COURT REPORTER: Mr. Pipes, are you ordering the transcript today?

MR. PIPES: Yes.

THE COURT REPORTER: Do you have a preference?

MR. PIPES: I would like a compressed and an ASCII is fine.

(Recess.)

CROSS EXAMINATION

BY MR. LASKEY:

**Q I just have one very brief area. Mr. Angus, towards the end of the questioning by you of Mr. Pipes, he was asking you about alternative designs and time frames. And you stated that you thought that a patent was issued on an alternative design around the 2005 time frame. Did you misspeak there?**

A I did misspeak. It was actually filed in the 2005 time frame and issued later on. I was mistaken there.

**Q Do you know when it was issued?**

A I believe it was issued in 2009 finally then.

**Q So back in the time frame when this product was manufactured around March 2006, was Dormont aware of any alternative design regarding bonding or grounding of gas appliance connectors?**

A I would not have been then since it was not issued until 2009 then.

MR. LASKEY: Okay. Those are all of the

questions that I have.

MR. PIPES: I just have one follow-up.

REDIRECT EXAMINATION

BY MR. PIPES:

**Q Does Dormont employ any electrical engineers?**

A I do not believe that anybody has an electrical engineering degree. I do not.

**Q Does it have a design department?**

A Yeah, we actually -- our department is called, new product development.

**Q And how many individuals are in that department?**

A Currently, there are three of us: Myself, I'm the director of new product development, there is one product engineer, and one product engineering technician.

**Q Can you identify them and tell me a little bit about their education and include yourself in that?**

A Sure. Myself, my background is -- I have been with Dormont since 1998. My degree is in mechanical engineering from Carnegie Mellon University. I started out with Dormont as a manufacturing engineer and then after, I believe, two

or three years transitioned over into product engineering. And then in that 2005 time frame is when I became director of new product development and have been in that capacity since then.

Eric Hanna, H-A-N-N-A, is the product engineer. He has only been with Dormont for about two years now. He comes to us with a -- I'm trying to think specifically what his degree is in, and I'm not quite sure. He went to Penn State Baron, which is in Erie, Pennsylvania. He does have an engineering degree. I just can't remember off the top of my head which discipline it is in. But like I said, he's only been with us for a couple of years in that product engineering capacity. I believe in 2011 or 2012 is when he was hired.

Lee Williams is our product engineering technician. Actually, Lee has been with us, I believe, almost as long as I have been there. I think he's been there about 13 or 14 years. Lee has an associate's degree in -- once again, I'm not quite sure. I haven't looked at his resume in quite some time, so I'm not quite sure what his associate's degree is in, but he takes care of our engineering lab. He does our product testing from that perspective. He is a technician. So he's been with

us for, I think, about 13 years. So that's kind of the background of our department.

**Q And can you give me the same information for the 2005, 2006 time frame?**

A I'm thinking we had -- I think we had three or four product engineers at that time in addition to myself. Lee Williams, our technician, was obviously there at that time. Brian Popp, who we talked about, was there at that time in the capacity of product liability and codes and standards.

Mike, an individual named Mike Lyon, L-Y-O-N, was there as a product engineer. He as well graduated from Penn State Baron in Erie, Pennsylvania with a -- I believe his degree was in mechanical engineering.

**Q Where is Mr. Lyon now?**

A Mr. Lyon is with a company called Curtis Wright, which is right outside of Pittsburgh, Pennsylvania as well. He was -- I think he left Dormont in that 2007/2008 time frame.

Another individual was Tim Struna, S-T-R-U-N-A. He was also a mechanical engineer from Penn State. I believe he went to Penn State main campus.

MR. LASKEY: He must be a genius.

THE WITNESS: He must be, yeah. He was also a product engineer for us at the time, and he is with -- I believe he is currently with Westinghouse as well. I think he also departed in that 2007/2008 time frame.

BY MR. PIPES:

**Q Was there some type of layoff?**

A Yeah. Yes, sir, there was a reduction in force at that time at Dormont in that 2007/2008. It must have been closer to 2008 because it was right after the industry and the market kind of went in that real big trough back in that time frame, so we had a reduction in force at that time to compensate for what was going on in the marketplace.

**Q And your department deals with gas appliance connectors only or other products?**

A Well, gas appliance connectors are the only products that we manufacture at Dormont in Export, PA. So yes -- I mean, my department handles that specific product lines. Dormont also bought what -- we have a line of complimentary products that we basically buy and sell into the gas industry as well, so these products are manufactured by other companies outside of Dormont, and we bring those products in and sell them as complimentary products

with our gas appliance connectors.

**Q And what are those products?**

A Various things such as quick disconnects, multi-plain swivels, full-port shutoff valves, combination shutoff valves, quick disconnects. We also have a line of water products that we supply into the food service industry as a compliment, things such as faucets, a little bit of filtration. And most of those are provided via our parent company, Watts Water Technologies. That's their core competency is water products and water filtration. So we basically take a Walls branded product and just basically funnel it through our Dormont food service channel distribution.

MR. PIPES: All right. Thank you very much.

MR. LASKEY: We will read and sign.

(Deposition concluded, 12:38 p.m.)

(Signature reserved.)

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CERTIFICATE

COMMONWEALTH OF PENNSYLVANIA AT LARGE, to wit:

I, Susan K. Morris, Court Reporter, Notary Public in and for the Commonwealth of Pennsylvania at Large, and whose commission expires November 2, 2016, do certify that the aforementioned appeared before me, was sworn by me, and was thereupon examined by counsel; and that the foregoing is a true, correct, and full transcript of the testimony adduced.

I further certify that I am neither related to nor associated with any counsel or party to this proceeding, nor otherwise interested in the event thereof.

Given under my hand and notarial seal at Johnstown, Pennsylvania, this 2nd day of April, 2014.

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Susan K. Morris, Court Reporter, Notary Public
Commonwealth of Pennsylvania at Large

READING AND SIGNING OF DEPOSITION

TO BE ATTACHED TO THE DEPOSITION OF MICHAEL ANGUS

TAKEN ON 3-25-2014 SUSAN K. MORRIS, STENOGRAPHER
IN THE MATTER OF DOUCET, et al. V. DORMONT

PAGE/LINE CHANGE OR CORRECTION

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I have inspected and read my deposition as captioned above and have listed all changes above, along with my reasons therefore.

DATE_____

SIGNATURE_____