



## Public Input No. 11-NFPA 211-2019 [ Global Input ]

Remove “ANSI” and “Standard for” from UL standards throughout the document.

### Statement of Problem and Substantiation for Public Input

Removal of repetitive wording and removal of ANSI because many years ago, UL preferred the ANSI/UL reference because there was a transition of traditional UL standards towards an ANSI standards development process.

Now, years later, a large majority of UL Standards are ANSI approved and follow the ANSI development and maintenance process. However, sometimes readers are confused because they don't understand the standards are UL standards, not developed by ANSI. There are many other references to standards promulgated by different standards development organizations where they are considered ANSI approved but do not include ANSI in the reference.

### Submitter Information Verification

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**Submittal Date:** Fri Dec 27 11:49:22 EST 2019

**Committee:**

### Committee Statement

**Resolution:** [FR-5-NFPA 211-2021](#)

**Statement:** UL Standards are largely ANSI approved and having the designation ANSI can confuse the user of the standard into thinking ANSI is the reviser of the standard and not UL.



## Public Input No. 21-NFPA 211-2021 [ Global Input ]

Two years ago we formed a task group to harmonize and improve the respective standards NFPA31/54/211 as they relate to chimneys and vents. NFPA 31 is the standard for oil burning equipment, NFPA 54 is the standard for gas fired equipment and NFPA 211 covers chimneys for all fuels. After reviewing the respective codes with colleagues, we found several instances of overlap, but also varying terminology and definitions for terminology. It is not surprising that the standards have evolved differently over time. Unfortunately, these differences along with newer technologies are sowing confusion for appliance & chimney/vent manufacturers, consulting engineers and inspectors alike.

After a short discussion with the group, it was suggested that NFPA create a master standard for chimneys and vents, while allowing the individual standards to maintain authority over their particular scopes. While not a national standard, NFPA 211 contains information for venting all fuel types and would be best situated to include the chimney and vent sections from NFPA 54 as well as NFPA 31 to create a master and national standard for chimneys and vents. Once a national standard is created, it would make it easier to establish uniform terminology and requirements. A section on commissioning may also be included to help the installers and inspectors properly commission and inspect the chimney and vent systems. Also, issues such as dual fuel appliances that condense, or systems serving appliances burning multiple fuels may also be addressed in a single national standard. All of this may be done while allowing NFPA 54 and NFPA 31 to control their chimney and vent sections.

To accomplish harmonize these three standards, NFPA would first need to revise the scope for NFPA 211. The committee would then need to dissect out the chimney and vent definitions and chapters from NFPA 31 and NFPA 54 and add them into NFPA 211. A subgroup was formed to parse through the definitions required to be added to NFPA 211. This public comment includes the work product of the sub group and suggested additions to NFPA211.

### Additional Proposed Changes

| <u>File Name</u>                   | <u>Description</u>                 | <u>Approved</u> |
|------------------------------------|------------------------------------|-----------------|
| NFPA_211_Consolidation_Refined.pdf | New-Revised NFPA 211 Terminologies |                 |

### Statement of Problem and Substantiation for Public Input

Currently, engineers, code officials, and manufacturers must consult several standards to correctly design chimney/vent systems for appliances. As NFPA 31, 37, 54 and 211 have developed venting and chimney standards separately over time, some of the terminologies in each standard either don't exist in other standards or worse, conflict. With modern appliance technology and draft control system technologies, it is possible to have vent/chimney combinations that are not covered by a single standard. Conflicting terminologies can create confusion with users. We are proposing to add relevant terminologies to NFPA 211 from NFPA 54, 37 and NFPA31 to introduce a complete terminology list to provide guidance to our users. We believe NFPA 211 is the proper place for this consolidation as the standard currently cover chimneys and vents. Consolidating the terminologies is the first step to creating a single more comprehensive documents to cover the requirements and sizing for all types of appliances.

### Submitter Information Verification

**Submitter Full Name:** Timothy McNulty  
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**Submittal Date:** Tue Jun 01 10:49:01 EDT 2021  
**Committee:** CHI-AAA

## Committee Statement

**Resolution:** [CI-10-NFPA 211-2021](#)

**Statement:** Currently, engineers, code officials, and manufacturers must consult several standards to correctly design chimney/vent systems for appliances. As NFPA 31, 37, 54 and 211 have developed venting and chimney standards separately over time, some of the terminologies in each standard either don't exist in other standards or worse, conflict. With modern appliance technology and draft control system technologies, it is possible to have vent/chimney combinations that are not covered by a single standard. Conflicting terminologies can create confusion with users. We are proposing to add relevant terminologies to NFPA 211 from NFPA 54, NFPA 37 and NFPA 31 to introduce a complete terminology list to provide guidance to our users. We believe NFPA 211 is the proper place for this consolidation as the standard currently cover chimneys and vents. Consolidating the terminologies is the first step to creating a single more comprehensive documents to cover the requirements and sizing for all types of appliances.

| Terminology                                      | Final Recommendation                                                                                                                                                                | Substantiation                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Appliance</b>                                 | Any device that utilizes a fuel to produce light, heat, power, refrigeration, or air conditioning, <u>or any device that compresses fuel gas.</u>                                   | This is a more well defined terminology for Appliance and is included in NFPA 54                                                                                                                                                                                                                               |
| <b>Appliance Categorized Vent Diameter/Area.</b> | The minimum vent diameter/area permissible for Category I appliances to maintain a nonpositive vent static pressure when tested in accordance with nationally recognized standards. | This definition will be required for sizing requirements of Category I appliances                                                                                                                                                                                                                              |
| <b>Automatic Vent Damper.</b>                    | Subset of Damper. See Automatically Operated Damper                                                                                                                                 | Automatic dampers have separate terminologies across various standards, this is an attempt to define a single terminology                                                                                                                                                                                      |
| <b>Baffle.</b>                                   | An object integral to an appliance to change the direction of or retard the flow of air, air-gas mixtures, or flue gases                                                            | Baffles should be included in NFPA 211 as not be confused as manually operated dampers                                                                                                                                                                                                                         |
| <b>Balancing Baffle.</b>                         | An object placed in an appliance connector to change the direction of or retard the flow of air, air-gas mixtures, or flue gases                                                    | Balancing baffles are currently being utilized in chimney/vent systems and should be defined                                                                                                                                                                                                                   |
| <b>Barometric Damper.</b>                        | See Barometric Draft Regulator                                                                                                                                                      | The proper term for a barometric damper is Barometric draft regulator                                                                                                                                                                                                                                          |
| <b>Breeching.</b>                                | The conduit conveying flue gas from <u>one or more appliances</u> to the vent or chimney.                                                                                           | Since Breeching, Common Vent, Common Vent Manifold, & Manifold are all defining the same portion of the vent (or chimney) system, one term should be selected as the primary term and the other three terms should then reference the primary. NFPA 54 also uses "Vent Connector Manifold" as a section title. |
| <b>Btu.</b>                                      | Abbreviation for British thermal unit, which is the quantity of heat required to raise the temperature of 1 pound of water 1 degree Fahrenheit (equivalent to 1055 joules).         | This is a more well defined terminology for Btu and is included in NFPA 54                                                                                                                                                                                                                                     |
| <b>Burner.</b>                                   | A device for the final conveyance of gas, or a mixture of gas and air, to the combustion zone.                                                                                      | The terminology should be included to define this part of the appliance in NFPA 211                                                                                                                                                                                                                            |
| <b>Category I Vented Appliance.</b>              | An ANSI listed appliance that operates with a nonpositive vent static pressure and with a vent gas temperature that avoids excessive condensate production in the vent.             | The categorized appliance terminologies should be broken out to make the terms more accessible. The venting of categorized appliances should not be determined by the listing of the appliances                                                                                                                |
| <b>Category II Vented Appliance.</b>             | An ANSI listed appliance that operates with a nonpositive vent static pressure and with a vent gas temperature that can cause excessive condensate production in the vent.          | The categorized appliance terminologies should be broken out to make the terms more accessible. The venting of categorized appliances should not be determined by the listing of the appliances                                                                                                                |

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| <b>Category III Vented Appliance.</b>                               | An ANSI listed appliance that operates with a positive vent static pressure and with a vent gas temperature that avoids excessive condensate production in the vent.                                       | The categorized appliance terminologies should be broken out to make the terms more accessible. The venting of categorized appliances should not be determined by the listing of the appliances                                                                                                   |
| <b>Category IV Vented Appliance.</b>                                | An ANSI listed appliance that operates with a positive vent static pressure and with a vent gas temperature that can cause excessive condensate production in the vent.                                    | The categorized appliance terminologies should be broken out to make the terms more accessible. The venting of categorized appliances should not be determined by the listing of the appliances                                                                                                   |
| <b>Common Vent.</b>                                                 | Subset of manifold. See breeching                                                                                                                                                                          | Since Breeching, Common Vent, Common Vent Manifold, & Manifold are all defining the same portion of the vent system, one term should be selected as the primary term and the other three terms should then reference the primary. NFPA 54 also uses "Vent Connector Manifold" as a section title. |
| <b>Common Vent Manifold.</b>                                        | Subset of manifold. See breeching.                                                                                                                                                                         | Since Breeching, Common Vent, Common Vent Manifold, & Manifold are all defining the same portion of the vent system, one term should be selected as the primary term and the other three terms should then reference the primary. NFPA 54 also uses "Vent Connector Manifold" as a section title. |
| <b>Condensate.</b>                                                  | The liquid that separates from a gas because of a reduction in temperature or an increase in pressure.                                                                                                     | Added to be able to reference condensate production and removal                                                                                                                                                                                                                                   |
| <b>Damper.</b>                                                      |                                                                                                                                                                                                            | Dampers should be a master category for Automatic and manual                                                                                                                                                                                                                                      |
| <b>Damper, Backflow Preventer</b>                                   | Subset of Damper. A listed device placed in the connector to prevent products of combustion entering idle ppliances.                                                                                       | Backflow prevention dampers are being widely used in common vent systems for categorized appliances and should be addressed by code                                                                                                                                                               |
| <b>Decorative Appliance for Installation in a Vented Fireplace.</b> | A self-contained, freestanding, fuel gas-burning appliance designed for installation only in a vented fireplace and whose primary function lies in the aesthetic effect of the flame.                      | Added to improve appliance definitions in NFPA 211                                                                                                                                                                                                                                                |
| <b>Device.</b>                                                      |                                                                                                                                                                                                            | This is needed for subsection definitions of devices                                                                                                                                                                                                                                              |
| <b>Direct Vent Appliance (Sealed Combustion System Appliance).</b>  | Appliances that are constructed and installed so that all air for combustion is derived directly from the outdoors and all flue gases are discharged to the outdoors.                                      | "Direct Vent System" needs to be removed from this term. NFP 54 uses a more widely accepted terminology                                                                                                                                                                                           |
| <b>Direct Vent System.</b>                                          | Vent and duct system serving listed direct-vent appliances where all flue gases are discharged to the outdoors and the air for combustion is directly derived from the outdoors. See Direct Vent Appliance | This term was not shown in the "Combined" spreadsheet so I added it. This term has nothing to do with an appliance. "Sealed Combustion System" should be added as an NFPA 211 term and reference "Direct Vent System"                                                                             |

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|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Direct-Fired Appliance.</b>                 | A fuel-burning appliance in which the products of combustion (flue gases) are mixed with the medium (e.g., air) being heated.                                                          | Added to improve appliance definitions in NFPA 211                                                                                                                          |
| <b>Draft Control.</b>                          | See Draft Regulator.                                                                                                                                                                   | Added as a widely accepted term for draft regulator                                                                                                                         |
| <b>Draft Regulator (Barometric).</b>           | A listed balanced damper device attached to a chimney, vent connector, breeching, or flue gas manifold to control chimney draft.                                                       | Rename "Barometric Draft Regulator" or "Barometric Damper"; add "listed" as a descriptor to "made part of a connector..."; should be added as a subset to "Draft Regulator" |
| <b>Draft Regulator.</b>                        | A listed device that functions to maintain a desired draft in the appliance by automatically maintaining the draft to the desired value.                                               | Add "modulating damper", "sequential draft control" and "barometric damper" as subset definitions?                                                                          |
| <b>Exterior Masonry Chimneys.</b>              | Subset of Masonry Chimney. Masonry chimneys exposed to the outdoors on one or more sides below the roof line.                                                                          | Added as the sizing implications are different between an interior and exterior masonry chimney                                                                             |
| <b>Factory-Built Chimney.</b>                  |                                                                                                                                                                                        | This terminology is widely used and should be included for the reader to be able to refer to the correct terminologies                                                      |
| <b>FAN Max.</b>                                | The maximum input rating of a Category I, fan-assisted appliance attached to a vent or connector.                                                                                      | This terminology needs to be included for inclusion of the vent sizing tables                                                                                               |
| <b>FAN Min.</b>                                | The minimum input rating of a Category I, fan-assisted appliance attached to a vent or connector.                                                                                      | This terminology needs to be included for inclusion of the vent sizing tables                                                                                               |
| <b>FAN+FAN.</b>                                | The maximum combined appliance input rating of one or more Category I, fan-assisted appliances and one or more Category I, draft hood-equipped appliances attached to the common vent. | This terminology needs to be included for inclusion of the vent sizing tables                                                                                               |
| <b>FAN+NAT.</b>                                | The maximum combined appliance input rating of two or more Category I, fan-assisted appliances attached to the common vent.                                                            | This terminology needs to be included for inclusion of the vent sizing tables                                                                                               |
| <b>Fan-Assisted Combustion System.</b>         | An appliance equipped with an integral mechanical means to either draw or force products of combustion through the combustion chamber or heat exchanger.                               | This terminology is widely used in sizing and categories.                                                                                                                   |
| <b>Fan-Type Wall Furnace.</b>                  | A wall furnace equipped with a fan for the circulation of air.                                                                                                                         | Added to improve appliance definitions in NFPA 211                                                                                                                          |
| <b>Gravity-Type Wall Furnace.</b>              | A wall furnace dependent on the circulation of air by gravity.                                                                                                                         | Added to improve appliance definitions in NFPA 211                                                                                                                          |
| <b>Heat Reclaimer, Chimney Connector-Type.</b> | A heat exchanger intended to be installed in a chimney connector between a heating appliance and the chimney to transfer heat from the flue gases through metal to air or water.       | When looking for definitions, it is more logical to put "heat reclaimer" first in the terminology. We recommend only changing the terminology                               |
| <b>Hot Water Heating Boiler.</b>               | A boiler designed to heat water for circulation through an external space heating system.                                                                                              | Added to improve appliance definitions in NFPA 211                                                                                                                          |

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| <b>Hot Water Supply Boiler.</b>          | A low-pressure hot water boiler having a volume exceeding 120 gal (454 L), or a heat input exceeding 200,000 Btu/hr (58.6 kW), or an operating temperature exceeding 200°F (93°C) that provides hot water to be used outside the boiler.                     | Added to improve appliance definitions in NFPA 211                                                                                                                                                                                                                                                |
| <b>Industrial High-Heat Appliance.</b>   | See Non-residential High Heat appliance                                                                                                                                                                                                                      | This terminology is widely used, but there is no current definition that covers the term                                                                                                                                                                                                          |
| <b>Industrial Low-Heat Appliance.</b>    | See Non-residential Low Heat appliance                                                                                                                                                                                                                       | This terminology is widely used, but there is a current definition that covers the term                                                                                                                                                                                                           |
| <b>Industrial Medium-Heat Appliance.</b> | See Non-residential Low heat appliance                                                                                                                                                                                                                       | This terminology is widely used, but there is a current definition that covers the term                                                                                                                                                                                                           |
| <b>Radiant Room Heater.</b>              | A room heater designed to transfer heat primarily by infrared or direct radiation.                                                                                                                                                                           | NFPA 211 currently does not include infrared heaters, this improves the terminology                                                                                                                                                                                                               |
| <b>Liquid Fuel.</b>                      | Subset of Fuel. For the purposes of this standard, any combustible liquid burned in an appliance or equipment as identified under the definition of heating fuel.                                                                                            | This terminology is widely used, but there is no current definition that covers the term                                                                                                                                                                                                          |
| <b>Low-Heat Appliance.</b>               | Subset of appliance. See Non-Residential Low heat                                                                                                                                                                                                            | This terminology is widely used, but there is a current definition that covers the term                                                                                                                                                                                                           |
| <b>Manifold.</b>                         |                                                                                                                                                                                                                                                              | Since Breeching, Common Vent, Common Vent Manifold, & Manifold are all defining the same portion of the vent system, one term should be selected as the primary term and the other three terms should then reference the primary. NFPA 54 also uses "Vent Connector Manifold" as a section title. |
| <b>Mechanical Draft.</b>                 | Draft produced by a fan or an air or steam jet. When a fan is located so as to push the flue gases through the chimney or vent, the draft is forced. When the fan is located so as to pull the flue gases through the chimney or vent, the draft is induced. | This is a more well defined terminology for Mechanical Draft and includes definitions as used.                                                                                                                                                                                                    |
| <b>Mechanical Draft System.</b>          | A venting system designed to remove flue or vent gases by mechanical means, which can consist of an induced draft portion under nonpositive static pressure or a forced draft portion under positive static pressure.                                        | Consider changing term to "Mechanical Draft Systems" to parallel title of NFPA 54-2021 12.4.3. Removal of "venting" is more inclusive for chimneys.                                                                                                                                               |
| <b>Mechanical Exhaust System.</b>        | See Mechanical Draft System                                                                                                                                                                                                                                  | This terminology is used, but is covered by Mechanical Draft Systems                                                                                                                                                                                                                              |
| <b>Medium-Heat Appliance.</b>            | See Non-Residential Medium heat appliance                                                                                                                                                                                                                    | This terminology is widely used, but there is a current definition that covers the term                                                                                                                                                                                                           |
| <b>Metal Chimney.</b>                    | See Unlisted Metal (Smokestack) Chimney.                                                                                                                                                                                                                     | This terminology is widely used, but there is a current definition that covers the term. It is also used in other current terminologies in NFPA 211                                                                                                                                               |
| <b>Multiple-Fueled Appliance.</b>        | An appliance that is designed and intended to burn either solid, liquid, or gaseous fuels, or a combination of these.                                                                                                                                        | This terminology is included to meet a widely used class of appliances                                                                                                                                                                                                                            |

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|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>NA.</b>                                                                                                                    | Vent configuration "not allowed"...                                                                                                                                                                                                         | This terminology is required for sizing tables                                                                                   |
| <b>NAT Max.</b>                                                                                                               | The maximum input rating of a Category I, draft hood–equipped appliance attached to a vent or connector.                                                                                                                                    | This terminology is required for sizing tables                                                                                   |
| <b>NAT+NAT.</b>                                                                                                               | The maximum combined appliance input rating of two or more Category I, draft hood–equipped appliances attached to the common vent.                                                                                                          | This terminology is required for sizing tables                                                                                   |
| <b>Natural Draft System.</b>                                                                                                  | A venting system that relies on natural draft to convey the products of combustion.                                                                                                                                                         | This terminology will help define the differences between mechanical and natural draft systems. This terminology is widely used, |
| <b>Nonrecirculating Direct Gas-Fired Heating and Forced Ventilation Appliances for Commercial and Industrial Application.</b> | A nonrecirculating direct gas-fired heating and forced ventilation appliance in which all the products of combustion generated by the appliance are released into the outdoor airstream being heated.                                       | Added to improve appliance definitions in NFPA 211                                                                               |
| <b>Oil Burner.</b>                                                                                                            | A device for burning oil in heating appliances such as boilers, furnaces, water heaters, and ranges.                                                                                                                                        | Added to improve appliance definitions in NFPA 211                                                                               |
| <b>Oil-Burning Appliance (Oil-Burning Unit).</b>                                                                              | An appliance equipped with one or more oil burners and all the necessary safety controls, electrical equipment, and related equipment manufactured for assembly as a complete unit.                                                         | Added to improve appliance definitions in NFPA 211                                                                               |
| <b>Oil-Burning Stove.</b>                                                                                                     | A self-contained, freestanding, above-the-floor, indirect-fired appliance equipped with one or more oil burners.                                                                                                                            | Added to improve appliance definitions in NFPA 211                                                                               |
| <b>Oil-Gas-Fired Appliance.</b>                                                                                               | An appliance that is capable of burning fuel oils and fuel gases as a main fuel source in an alternate manner.                                                                                                                              | Added to improve appliance definitions in NFPA 211                                                                               |
| <b>Pool Heater.</b>                                                                                                           | An appliance designed for heating nonpotable water stored at atmospheric pressure, such as water in swimming pools, therapeutic pools, and similar applications.                                                                            | Added to improve appliance definitions in NFPA 211                                                                               |
| <b>Power Venting.</b>                                                                                                         | See Mechanicla Draft Systems                                                                                                                                                                                                                | BR- Should be a "See x.x.x, Mechanical Draft Systems"                                                                            |
| <b>Recirculating Direct Gas-Fired Heating and Forced Ventilation Appliances for Commercial and Industrial Application.</b>    | A recirculating direct gas-fired heating and forced ventilation appliance in which all of the products of combustion generated by the appliance are released into the airstream being heated.                                               | Added to improve appliance definitions in NFPA 211                                                                               |
| <b>Safety Shutoff Device.</b>                                                                                                 | A device that will shut off the gas supply to the controlled burner(s) in the event the source of ignition fails. This device can interrupt the flow of gas to main burner(s) only or to pilot(s) and main burner(s) under its supervision. | This terminology is required to meet specifications/requirements for mechanical draft systems                                    |

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|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sealed Combustion Venting System.</b> | See Direct Vent Appliance                                                                                                                                                                                                                                                                                                                                  | Terminology should be included as it is widely used, but should be referred to existing terminology. A vent system is not an appliance. This should be a "See x.x.x, Direct Vent System" |
| <b>Sidewall or Through-Wall Venting.</b> | A mechanical means applied to a nearly horizontal venting system to remove combustion products without benefit of a chimney or significant natural draft.                                                                                                                                                                                                  | BR- NFPA 2021 12.9 uses the term "Through-the-wall" in its section title                                                                                                                 |
| <b>Stationary Industrial Furnace.</b>    | A low-, medium-, or high-heat appliance classified in accordance with its character and size and the temperatures developed in the portions thereof where substances or materials are heated for baking, drying,                                                                                                                                           | Added to improve appliance definitions in NFPA 211                                                                                                                                       |
| <b>Total Input Rating.</b>               | The sum of the maximum Btu rating, as marked on the appliance by the manufacturer, of all appliances, not the nozzle sizes or actual firing rates.                                                                                                                                                                                                         | TM- Add new to Section 4 - All chimneys and vents shall be sized for the total input rating.                                                                                             |
| <b>Unit Heater.</b>                      | A self-contained, automatically controlled, vented fuel gas burning, space heating appliance intended for the heating of the space in which it is installed in without the use of ducts, having an integral means for circulation of air. A unit heater can be an indirect-fired fuel-burning appliance or might utilize steam, hot water, or electricity. | Added to improve appliance definitions in NFPA 211 to more widely accepted types of the terminology                                                                                      |
| <b>Vent Connector.</b>                   | The pipe that connects a fuel-burning appliance to a breeching, chimney or manifold.                                                                                                                                                                                                                                                                       | BA vent connector can also connect a fuel-burning appliance to a breeching, manifold, etc.; no need for specifically stating "L Vent" as its covered by "vent"                           |
| <b>Vent Offset.</b>                      | An arrangement of two or more fittings and pipe installed for the purpose of locating a vertical or horizontal section of vent pipe in a different but parallel plane with respect to an adjacent section of vertical vent pipe.                                                                                                                           | This terminology should be added to NFPA 211 for sizing requirements as well as being a widely used terminology                                                                          |
| <b>Vented Appliance.</b>                 | See Gas Appliance Categories                                                                                                                                                                                                                                                                                                                               | Added to improve appliance definitions in NFPA 211 to more widely accepted types of the terminology                                                                                      |
| <b>Wall Furnace.</b>                     | A self-contained vented appliance, complete with grilles or equivalent, designed for incorporation in or permanent attachment to the structure of a building, manufactured home, or recreational vehicle and furnishing heated air directly into the space to be heated through openings in the casing.                                                    | Added to improve appliance definitions in NFPA 211 to more widely accepted types of the terminology                                                                                      |
| <b>Water Heater.</b>                     | A fuel-burning appliance for <u>domestic or commercial</u> purposes used for heating water to a temperature not more than 200°F (93°C).                                                                                                                                                                                                                    | Modified to reflect a more robust definition                                                                                                                                             |



## Public Input No. 24-NFPA 211-2021 [ Global Input ]

4.1.1.3 The chimney or vent system shall be sized for the total btu input.

### Statement of Problem and Substantiation for Public Input

Many systems are currently being sized for partial load instead of the total btu. The theory is the appliances are sized for redundancy, so the vent or chimney system should be sized for the required btu instead of the total btu. In practice, building operations change over time and may require more btu's than the original design. while the total appliance btu might be able to compensate for the change the chimney or vent system cannot.

### Submitter Information Verification

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**Submittal Date:** Tue Jun 01 15:23:16 EDT 2021

**Committee:** CHI-AAA

### Committee Statement

**Resolution:** [FR-4-NFPA 211-2021](#)

**Statement:** Many systems are currently being sized for partial load instead of the total btu. The theory is the appliances are sized for redundancy, so

the vent or chimney system should be sized for the required btu instead of the total btu. In practice, building operations change over time

and may require more btu's than the original design and as such should be sized for the total btu load.



## Public Input No. 2-NFPA 211-2019 [ Section No. 1.1 ]

### 1.1 Scope.

This standard applies to the design, installation, maintenance, and inspection of all chimneys, ~~fireplaces~~, venting systems, and solid fuel-burning appliances and fireplaces .

## Statement of Problem and Substantiation for Public Input

This change is proposed to clarify that fireplaces burning fuels other than solid-fuel are not covered by this standard.

## Submitter Information Verification

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**Submittal Date:** Tue Dec 03 13:39:49 EST 2019

**Committee:** CHI-AAA

## Committee Statement

**Resolution:** Changing the order of of the words would cause confusion to users of the code as certain appliances are within the scope of NFPA 211 while other appliances are not.

**Public Input No. 14-NFPA 211-2020 [ Section No. 2.3.2 ]****2.3.2 ASTM Publications.**

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM C27, *Standard Classification of Fireclay and High-Alumina Refractory Brick*, 1998, reapproved 2013 2018 .

ASTM C199, *Standard Test Method for Pier Test for Refractory Mortars*, 1984, reapproved 2014 2016 .

ASTM C315, *Standard Specification for Clay Flue Liners and Chimney Pots*, 2007, reapproved 2014 2016 .

ASTM C476, *Standard Specification for Grout for Masonry*, 2010 2019 .

ASTM C1261, *Standard Specification for Firebox Brick for Residential Fireplaces*, 2013, reapproved 2017 e1 .

ASTM E136, *Standard Test Method for Behavior of Materials in a Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C*, 2016 2019a .

ASTM E1602, *Standard Guide for Construction of Solid Fuel Burning Masonry Heaters*, 2003 (2010 2017 ).

**Statement of Problem and Substantiation for Public Input**

updates

**Related Public Inputs for This Document**

| <u>Related Input</u>                                      | <u>Relationship</u> |
|-----------------------------------------------------------|---------------------|
| Public Input No. 13-NFPA 211-2020 [New Section after 4.1] |                     |

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**Committee:** CHI-AAA

**Committee Statement**

**Resolution:** FR-2-NFPA 211-2021

**Statement:** The noncombustible material is being added to chapter 4 to provide requirements and test standards for noncombustible materials.



## Public Input No. 22-NFPA 211-2021 [ Section No. 2.3.3 ]

### 2.3.3 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 103, ~~Standard for Factory~~ *Factory -Built Chimneys for Residential Type and Building Heating Appliances*, revised ~~2012~~ 2010, revised 2016 .

~~ANSI~~ UL 127, ~~Standard for Factory~~ *Factory -Built Fireplaces*, 2011, revised ~~2015~~ 2019 .

UL 378, ~~Standard for Draft~~ *Draft Equipment*, 2006, revised 2013.

UL 959, ~~Standard for Medium~~ *Medium Heat Appliance Factory-Built Chimneys*, 2010, revised ~~2014~~ 2019 .

UL 2561, ~~Standard for~~ *1400 Degree Fahrenheit Factory-Built Chimneys*, 2016, revised 2018 .

## Statement of Problem and Substantiation for Public Input

Referenced standards are updated to reflect most recent publication date.

## Related Public Inputs for This Document

| <u>Related Input</u>                                    | <u>Relationship</u> |
|---------------------------------------------------------|---------------------|
| Public Input No. 11-NFPA 211-2019 [Global Input]        |                     |
| Public Input No. 23-NFPA 211-2021 [Section No. B.1.2.5] |                     |

## Submitter Information Verification

**Submitter Full Name:** Kelly Nicoello

**Organization:** UL LLC

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Tue Jun 01 12:18:10 EDT 2021

**Committee:** CHI-AAA

## Committee Statement

**Resolution:** FR-5-NFPA 211-2021

**Statement:** UL Standards are largely ANSI approved and having the designation ANSI can confuse the user of the standard into thinking ANSI is the reviser of the standard and not UL.



## Public Input No. 17-NFPA 211-2020 [ New Section after 3.3 ]

### TITLE OF NEW CONTENT

Type your content here ...

In place of the current definition of "Clearance", I propose substituting a definition of

"Air Space Clearance from Combustibles" as follows:

"The volume of space surrounding the heat producing appliance, chimney, chimney connector, vent, vent connector, or plenum and other surfaces such that the only materials in this volume are free-moving air and the sheet metal components that are Listed for the appliance, chimney, or vent, such as a fire stop, attic insulation shield, and thimble. This volume is defined by the exterior shape of the device, expanded by the clearance distance in all directions over the entire exterior area of the device. Positive means are to be present to assure no unwanted solid materials enter this volume of space during the life of the structure."

I further propose that wherever the term "Clearance from Combustibles" is now used in NFPA 211 and other standards, the term "Air Space Clearance from Combustibles" be used in its place to be as clear as possible.

My comments: The purpose of this change is to clarify that:

1. Further clarify that:

a. No solid materials, even non-combustible materials such as fiberglass insulation is to be in this volume surrounding the heat producing item.

b. The air should be free-moving air, except for sheet metal components that are Listed and tested for this device.

c. The clearances need to be maintained over time, so any minor expansion, contraction, and/or disturbance during maintenance does not defeat these clearances.

2. It is also my purpose to begin to standardize nomenclature within product design, installation manuals, construction planning, and inspection functions to clarify that just clearance to combustibles is not sufficient, but air space clearance to combustibles over the life of the structure is absolutely necessary. I will be discussing this with UL Laboratories as to updating the UL Standards such as 103, 127, 1482, etc. to require that labels and manuals for devices require air space to combustibles and to define this air space accurately and consistently.

I have forensic analysis that I am working on where it is not clear in the manual that the clearance needs to be free-moving air with the exception of a Listed sheet metal components and I think that this change will improve the communication of what is needed and reduce the number of poor installations and fires in the field.

I am open to word-smithing this proposal, however, I know that it needs to be much clearer to the seller, consumer, installer, general contractor, insulator, inspector, and maintenance personnel that these clearances are to be air space clearances.

### Statement of Problem and Substantiation for Public Input

I have real-life forensic analysis that I am working right now on where it is not clear in the installation manual that the clearance needs to be free-moving air with the exception of a Listed sheet metal components. I think that this change will improve the communication of what is needed and reduce the number of poor installations and fires in the field.

### Submitter Information Verification

**Submitter Full Name:** Chris Korinek

**Organization:** Synergy Forensic Engineering  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sat Oct 17 20:36:48 EDT 2020  
**Committee:** CHI-AAA

### Committee Statement

**Resolution:** The committee believes that clearance from combustibles is clear that it is talking about the clear airspace between the combustible and item being addressed. The appropriate UL standards in terms of the listings clearly define what clearance to combustibles means. The manufacturer's installation instructions also clearly define what they clearance to combustibles is as well.



## Public Input No. 3-NFPA 211-2019 [ Section No. 3.3.1 [Excluding any Sub-Sections] ]

Capable of being exposed for inspection, maintenance, or repair without damage to the chimney or building structure or finish, but which may require the removal of doors, panels, or coverings using commonly available tools. Accessibility shall not require the inspector to enter areas that will, in the professional judgement of the inspector, likely be dangerous to the inspector, other persons, or the property.

### Statement of Problem and Substantiation for Public Input

There are many areas that could be considered Accessible but that could also be unsafe to enter. An attic with low clearance, no flooring or walkway, excessive heat, etc. could all be dangerous to the property or inspector. A crawl space with standing water or wild animals could be considered Accessible but unsafe to enter. This proposal will provide the inspector some flexibility in deciding if an area is safe to enter.

### Submitter Information Verification

**Submitter Full Name:** James Brewer  
**Organization:** Rooftop Safety USA  
**Affiliation:** National Chimney Sweep Guild  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Dec 03 13:47:03 EST 2019  
**Committee:** CHI-AAA

### Committee Statement

**Resolution:** [FR-14-NFPA 211-2021](#)

**Statement:** There are many areas that could be considered Accessible but that could also be unsafe to enter. An attic with low clearance, no flooring or walkway, excessive heat, etc. could all be dangerous to the property or inspector. A crawl space with standing water or wild animals could be considered Accessible but unsafe to enter. This proposal will provide the inspector some flexibility in deciding if an area is safe to enter.



## Public Input No. 4-NFPA 211-2019 [ New Section after 3.3.47 ]

### TITLE OF NEW CONTENT

Type your content here ... 3.3.48\* Concealed (Non-accessible) Not capable of being exposed for inspection, maintenance, or repair without damage to the chimney, building structure, or finished surfaces, or without removal of permanently attached parts of the building, or without special tools. Safety hazards in any area may render that area non-accessible.

A.3.3.48 Concealed (Non-accessible) Areas of the chimney that can only be viewed by damaging finished surfaces of the home or removing permanently attached components of the home are generally considered non-accessible. Attics which provide less than 48" vertical clearance or 24" horizontal clearance are generally considered not accessible. Attics without walkways and having insulation which conceals the ceiling joists are generally considered not accessible. Attics with a temperature exceeding 115 degrees Fahrenheit are generally considered not accessible. Crawlspace which provide less than 24" of vertical clearance are generally considered not accessible. Hazards such as standing water, sewage or animal waste, broken glass, exposed or unsupported electrical wires, dangerous animals or insects will generally render an attic or crawlspace not accessible.

### Statement of Problem and Substantiation for Public Input

This area of accessibility into attics and crawl spaces has raised many questions that were unaddressed by the inspection standard. Most of the requirements I have included are just common sense numbers that seem right but I am sure they will be debated at the committee level. The 115 degree restriction was chosen because OSHA considers temperature above 115 to be an Extreme Hazard. The 48" attic height and 24" crawl space height are "borrowed" from a termite inspector guideline.

### Submitter Information Verification

**Submitter Full Name:** James Brewer  
**Organization:** ROOFTOP SAFETY USA LLC  
**Affiliation:** National Chimney Sweep Guild  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Dec 03 14:08:51 EST 2019  
**Committee:** CHI-AAA

### Committee Statement

**Resolution:** FR-18-NFPA 211-2021

**Statement:** This area of accessibility into attics and crawl spaces has raised many questions that were unaddressed by the inspection standard. The 115 degree restriction was chosen because OSHA considers temperature above 115 to be an Extreme Hazard. The 48" attic height and 24" crawl space height are "borrowed" from a termite inspector guideline.



## Public Input No. 12-NFPA 211-2020 [ Section No. 3.3.100 ]

### 3.3.100 Material.

#### 3.3.100.1\* Combustible Material.

A material that, in the form in which it is used and under the conditions anticipated, will ignite and burn; a material that does not meet the definition of noncombustible or limited-combustible [NFPA 5000]

#### 3.3.100.2 Noncombustible Material .

See 4.1

A.3.300.1 Examples of combustible materials include materials made of or surfaced with wood, compressed paper, plant fibers, plastics, or other material materials that can ignite and burn or burn , whether flameproofed or flame retarded or not, or whether plastered or unplastered.

#### ~~3.3.100.2 – Noncombustible Material.~~

~~A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors, when subjected to fire or heat; materials that are reported as passing ASTM E136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C* , shall be considered noncombustible materials.~~

## Statement of Problem and Substantiation for Public Input

The definition of combustible material is not generic enough and is simply a list of examples that would be better as an annex note. The definition of noncombustible material is not appropriate for the section on definitions (which are not enforceable) and it is recommended that it be moved to the body of the standard. In both cases the wording from NFPA 5000 is recommended. The wording for combustible material is extracted from NFPA 5000, section 3.3.408.1.

## Related Public Inputs for This Document

| <u>Related Input</u>                                             | <u>Relationship</u> |
|------------------------------------------------------------------|---------------------|
| <u>Public Input No. 13-NFPA 211-2020 [New Section after 4.1]</u> |                     |
| <u>Public Input No. 13-NFPA 211-2020 [New Section after 4.1]</u> |                     |

## Submitter Information Verification

**Submitter Full Name:** Marcelo Hirschler  
**Organization:** GBH International  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Thu Jan 02 19:09:23 EST 2020  
**Committee:** CHI-AAA

## Committee Statement

**Resolution:** FR-6-NFPA 211-2021

**Statement:** The definition of combustible material is not generic enough and is simply a list of examples that would be better as an annex note. The definition of noncombustible material is not appropriate for the section on definitions and it is being moved to the body of the standard. The wording for combustible material is extracted from NFPA 5000, section 3.3.408.1 for conformity across the NFPA Standards.



## Public Input No. 13-NFPA 211-2020 [ New Section after 4.1 ]

### **4.1 Noncombustible material [NFPA 5000]**

A material that complies with any one of the following shall be considered a noncombustible material:

(1)\* The material, in the form in which it is used, and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat.

(2) The material is reported as passing ASTM E136, Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C.

(3) The material is reported as complying with the pass/fail criteria of ASTM E136 when tested in accordance with the test method and procedure in ASTM E2652, Standard Test Method for Assessing Combustibility of Materials Using a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750 Degrees C.

A.4.1 (1) Examples of such materials include steel, concrete, masonry and glass. [NFPA 5000]

(Also add ASTM E2652, Standard Test Method for Assessing Combustibility of Materials Using a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750 Degrees C, 2018, into section 2 on referenced ASTM standards)

(Also renumber all subsequent sections in chapter 4)

## **Statement of Problem and Substantiation for Public Input**

This simply incorporates into NFPA 211 in section 4 on general requirements the requirement from 7.1.4.1 of NFPA 5000.

## **Related Public Inputs for This Document**

| <b><u>Related Input</u></b>                                    | <b><u>Relationship</u></b> |
|----------------------------------------------------------------|----------------------------|
| <u>Public Input No. 12-NFPA 211-2020 [Section No. 3.3.100]</u> |                            |
| <u>Public Input No. 12-NFPA 211-2020 [Section No. 3.3.100]</u> |                            |
| <u>Public Input No. 14-NFPA 211-2020 [Section No. 2.3.2]</u>   |                            |

## **Submitter Information Verification**

**Submitter Full Name:** Marcelo Hirschler  
**Organization:** GBH International  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Thu Jan 02 19:19:07 EST 2020  
**Committee:** CHI-AAA

## **Committee Statement**

**Resolution:** FR-2-NFPA 211-2021

**Statement:** The noncombustible material is being added to chapter 4 to provide requirements and test standards for noncombustible materials.



## Public Input No. 25-NFPA 211-2021 [ Section No. 4.2.2 ]

### 4.2.2

Natural draft chimneys and vents shall not terminate at an elevation less than 5 ft (1.53 m) above the flue collar or the highest connected draft hood outlet. Natural draft chimneys and vents shall terminate vertically above the roof or parapet.

*Exception: As provided in Section 10.7.*

## Additional Proposed Changes

| <u>File Name</u> | <u>Description</u> | <u>Approved</u> |
|------------------|--------------------|-----------------|
| Picture2.jpg     |                    |                 |
| Picture1.png     |                    |                 |

## Statement of Problem and Substantiation for Public Input

Many venting and chimney systems requiring natural draft have been terminated through a sidewall either with side wall termination or with a slight turnup. These systems do not provide enough natural draft for the appliance. While 211 addresses this, the user must parse through several requirements to arrive at that conclusion. This should eliminate confusion in the code.

## Submitter Information Verification

**Submitter Full Name:** Timothy McNulty  
**Organization:** RM Manifold Group Inc., Dba Us Draft Co.  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Jun 01 15:30:59 EDT 2021  
**Committee:** CHI-AAA

## Committee Statement

**Resolution:** FR-3-NFPA 211-2021

**Statement:** Many venting and chimney systems requiring natural draft have been terminated through a sidewall either with side wall termination or with a slight turnup. These systems do not provide enough natural draft for the appliance and are prohibited by the code. The exception is being rewritten as a requirement to meet the NFPA Manual of Style.







## Public Input No. 20-NFPA 211-2021 [ Section No. 9.7.12 ]

### 9.7.12

The following shall apply to gas or oil appliances:

- (1) A connector serving a gas or oil appliance shall be permitted to be connected to a masonry fireplace flue if one of the following conditions is met:
  - (a) The fireplace opening is sealed.
  - (b) The fireplace is abandoned and the chimney flue that vents the fireplace is permanently sealed below the connection.
- (2) Listed gas or oil appliances shall be installed in accordance with the listing.

### Additional Proposed Changes

| <u>File Name</u>                   | <u>Description</u>                                         | <u>Approved</u> |
|------------------------------------|------------------------------------------------------------|-----------------|
| Final_NFPA_Section_211_Comment.pdf | Public Comment on Section 211<br>Revision by Gary A. Braun |                 |

### Statement of Problem and Substantiation for Public Input

Section 211 needs to be revised to provide a minimum or baseline standard for attaching the connector pipe to the flue collar on heating devices, including oil-fired heating devices.

### Submitter Information Verification

**Submitter Full Name:** Gary Braun

**Organization:** - None -

**Affiliation:** None

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Fri May 28 14:06:28 EDT 2021

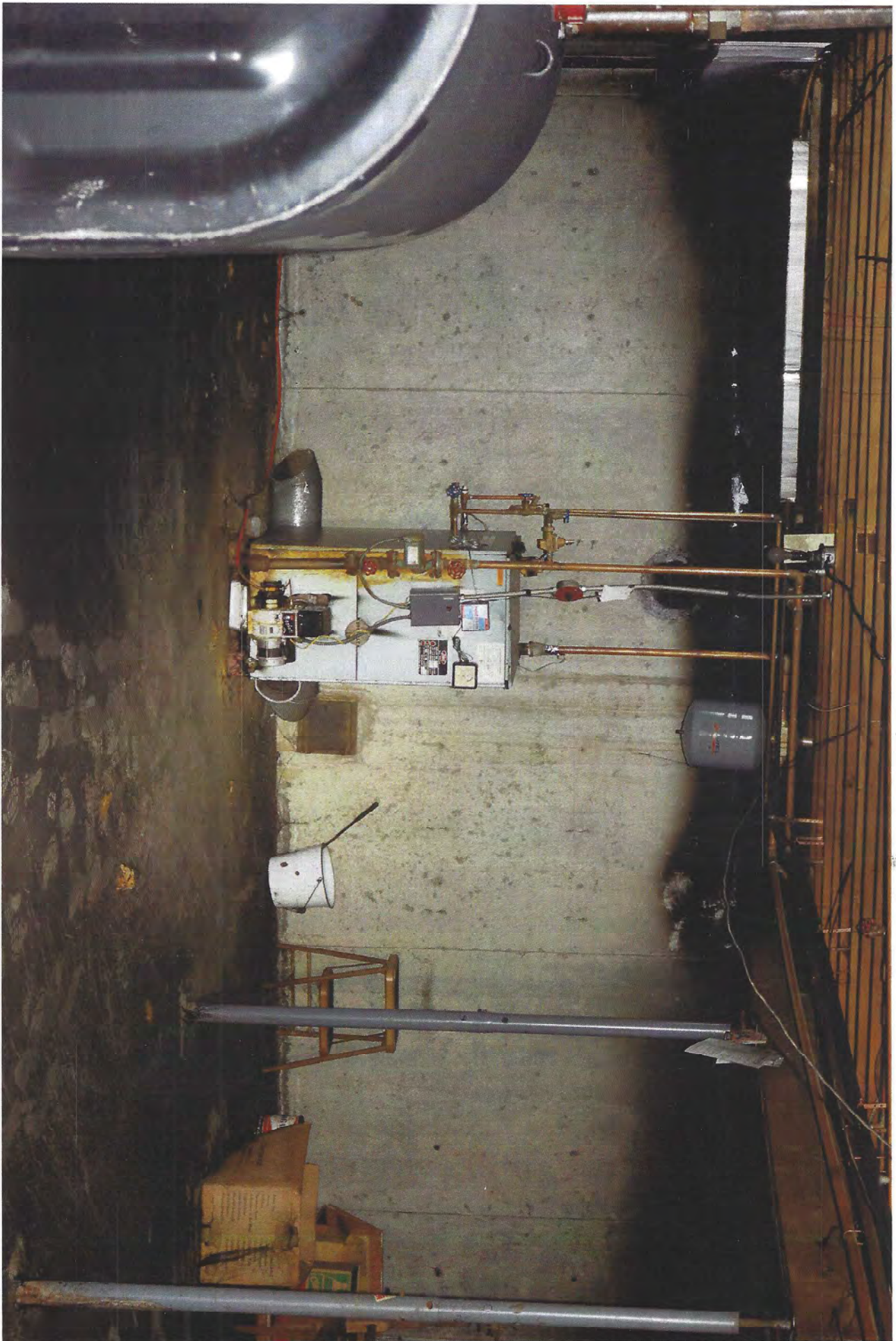
**Committee:** CHI-AAA

### Committee Statement

**Resolution:** CI-1-NFPA 211-2021

**Statement:** The technical committee is looking to revise the definition of connectors to include the connection between the connector and the appliance as well as the connector and the chimney. The task group that is looking into correlating NFPA 31/54/211 will also be looking at this item to standardize the 3 documents where connections between the appliance and connector exist.

Exhibit 1



**CASE ASSESSMENT:** [REDACTED]**I. Background**

This case involves the death of [REDACTED] DOB 4 [REDACTED] of [REDACTED] [REDACTED], NH, that occurred on or about [REDACTED] 2016 at her home. The Medical Examiner listed the cause of death as smoke and soot inhalation "most likely sustained as a result of a furnace malfunction according to preliminary reports by the State Fire Marshal."<sup>1</sup> (Autopsy report of Dr. Jennie Duval, [REDACTED], 2016, Page 6.)

Mrs. [REDACTED] lived alone in a small single family residence. While she was described as frail and suffered from diabetes, hypertension and hearing loss, she was relatively active in her community church, and possessed a car and valid driver's license. There is no suggestion from any aspect of the investigation that she was not mentally competent. She had regular contact with her neighbors, [REDACTED], and his mother, S. [REDACTED], of [REDACTED] [REDACTED] NH. The [REDACTED] routinely assisted Mrs. [REDACTED] with such tasks as yard work and small errands. Mrs. [REDACTED] mentioned in an interview on J [REDACTED], 2016 with the [REDACTED] Police that she could, from inside her home, see into Mrs. [REDACTED] kitchen and determine if the light was on, generally leading Mrs. [REDACTED] to assume Mrs. [REDACTED] was up and around.

Mrs. [REDACTED] told the police that about 6:30 a.m. on J [REDACTED] 2016 she saw Mrs. [REDACTED] kitchen light on. Later on that morning, around 11 a.m., she did not see any lights. She also noticed that there were no tire tracks in the slightly snow-covered driveway, indicating that Mrs. [REDACTED] car had not been driven that day. Mrs. [REDACTED] telephoned Mrs. [REDACTED] three times that morning, and each time received a busy signal. Ultimately, she asked M [REDACTED] to go to the [REDACTED] home and check. M [REDACTED] knocked on the door and looked in the windows, but reported in his interview on J [REDACTED] 2016, that he could not see anything. Mrs. [REDACTED] told [REDACTED] where the key was to Mrs. [REDACTED] home, and he unlocked the door to enter the home. It was at that time that he encountered thick smoke in the interior of the home. He did not enter. He called several times for Mrs. [REDACTED] but received no answer. Both [REDACTED] and S [REDACTED] called 911 at about 1:45 p.m.

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<sup>1</sup> The State Fire Marshal's Office refers to the cause of death as "carbon monoxide poisoning."

The [REDACTED] Fire Department responded. FD Capt. J [REDACTED] entered the residence equipped with SCBA and located Mrs. [REDACTED]'s body through thermal imaging. Her body was located on the cellar stairs. Capt. [REDACTED] could not see the body due to the thick smoke, but felt it with his foot. He moved the body from the stairs to the basement floor, and in so doing caused the movement of Mrs. [REDACTED] underwear that is shown in subsequent investigative photographs. Pineo determined that Mrs. [REDACTED] was deceased. He noted that the oil burner was operating, and no smoke detectors were sounding. [REDACTED] located the emergency shut off switch at the top of the cellar stairs and turned it to the off position. Other firefighters confirmed that Mrs. [REDACTED] had no carotid pulse. A hand-held fire extinguisher and container were found close to Mrs. [REDACTED] body, on the side of the stairs, away from the oil burner location. They were photographed in place.

The [REDACTED] FD entered the residence with a CO detection device. The highest reading was 193 ppm just after 4 p.m., but there is some uncertainty as to whether the time corresponded with the reading. The door between the basement and upper level had been found open upon entry. The flue pipes were found to be disconnected from the masonry chimney and from the back of the boiler. There were indications of the boiler covers being lifted and displaced. The barometric damper that was part of the boiler exhaust pipe was found near a basement wall, and there was a large amount of black soot and smoke that filled the entire interior of the house. (See report of [REDACTED] FD Chief [REDACTED] incorporating report of [REDACTED] FD [REDACTED]). State Fire Marshal Investigators [REDACTED], District Supervisor [REDACTED] and Chief Mechanical Inspector [REDACTED] conducted an on-scene investigation on the day of the event.

Investigator [REDACTED] noted in his September 14, 2016, narrative report that the flue pipes (two) were "strewn about the floor" and appeared to have "forcefully separated into several pieces at their seams and joints." The pipes were located "a distance" from the furnace "so as to indicate they had been forcefully ejected from the furnace toward this area where they now rested on the floor." On the wall behind the furnace, where the flue pipe had connected to a fitting within the chimney base, "there was a large area of very dark soot depositing (*sic*) Darker depositing of soot than I observed in any other location within the property." (*sic*)

A representative of [REDACTED], Inc., retained by [REDACTED] Insurance, inspected the boiler at [REDACTED] et, identifying it as a cast iron Utica boiler.<sup>8</sup> The examiner noted flue passageways were obstructed with light density oil combustion residue, describing it as a "soot-like product." The examiner concluded this was the result of the oil burner firing without complete combustion of the fuel. Further, the examiner concluded that the oil burner air intakes were obstructed with soot and dust and that the base of the oil burner had an accumulation of fuel.

An inspection of the flue pipes revealed two pieces, one 12" in length and one 24" in length. The system was outfitted with a draft regulator. This device was found, as noted above, a number of feet from the boiler. The vent pipes were found between the boiler and the foundation wall, dislodged from the boiler and the wall. The examiner concluded that a "small explosion in the firebox of the boiler dislodged the connector pipe between the boiler and the chimney." He said the boiler connector pipe was placed on the breaching of the boiler and then inserted into the chimney with no screws securing the joint, and could have easily been dislodged from the boiler "due to greater ability to twist and bend." He concluded that, since the boiler and burner continued operation, the exhaust was discharged into the basement.

Inspector [REDACTED] recorded in his narrative report that on [REDACTED] 2016, he told [REDACTED] that "there are no mandatory licensing laws regulating oil burner repair, replacement or installation trade" and that "the adopted codes and standards for oil burning equipment do not mandate how or what should be tested and or replaced during annual service of a boiler." Inspector [REDACTED] also recorded that he told [REDACTED] that the technician was experienced and that "during our interview, we found no basis for negligence or reckless acts by [REDACTED]."

In the same report, Inspector [REDACTED] notes that the cause [of the delayed ignition] remains inconclusive "due to the additional testing required by a third party testing agency which could perform instrument testing on the oil burning ignition device and the burner nozzle and assembly as well." (Emphasis supplied).

On [REDACTED] 2016, Attorney [REDACTED] of the Boston law firm of [REDACTED] [REDACTED], retained by [REDACTED], emailed Investigator [REDACTED] to request a meeting

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<sup>8</sup> Inspector [REDACTED] declined an invitation for the SFMO to be present for the inspection. (See Attachment C).

accumulated in the combustion chamber for an undetermined period of time and led to the eventual ignition, the separation of the flue pipes from the boiler and the introduction of smoke into the interior of the dwelling, resulting in [REDACTED] death.

The conclusion does not invalidate any of the findings of the expert retained by the GCAO nor does it resolve any of the troubling issues connected to the service call of [REDACTED], 2015, as outlined and discussed above. The conclusion, however, does remove any provable causal link between what appears to be a sub-standard performance by the service technician, at least with respect to the alleged administration of the combustion efficiency test and the failure to address a fire code violation regarding the attachment of the chimney connector to the boiler. What contribution, if any, to the accumulation of unignited fuel in the combustion chamber of the boiler was made by an incorrect nozzle type, size, or placement between [REDACTED] 2015 and [REDACTED], 2016 cannot be quantified. In short, there is no evidence with which to prove beyond a reasonable doubt that anything other than the defective transformer, which could have and likely did become defective after the [REDACTED], service call, was the sole or primary factor in causing the delayed ignition event. Therefore, despite the facially disconcerting aspects of the service technician's performance on the [REDACTED] 2015 service call, criminal liability cannot attach to them.

The analysis of the handling of the flue pipes during the [REDACTED] 2015 and previous service calls is more complex. Other than [REDACTED] consultant, no party has asserted that the flue pipes survived the delayed ignition event in place and were knocked to the floor inadvertently by first responders or investigators. Further, the statements of witnesses make such a scenario unlikely. Had the pipes remained intact, the overwhelming presence of smoke in the residence would be difficult to explain.

As set forth above, the NFPA Code is incorporated into the New Hampshire Fire Code. NFPA 31 requires chimney connectors to be supported and attached and flue pipes to be connected at the joints by at least three screws. The provision does not explicitly mandate three screws attaching the flue pipe to the boiler collar, but it does call for flue pipes to be secured, fastened and supported. The GCAO consultant, who served as a member of the NFPA [REDACTED] committee, is adamant that the code requires the flue pipe be securely fastened to the boiler with screws. While [REDACTED]'s consultant

disagrees, and maintained that a so-called "friction fit" is the industry standard, the undersigned has not been given corroborating information related to this assertion. The explanation that boilers pre-dating the regulations, such as the one at issue here, do not have collars with holes that permit the introduction of screws to fasten the pipe does not appear to absolve an installer or service technician from ensuring that the pipe is secured consistent with what the GCAO consultant maintains is the clear intent of the regulation. Moreover, NFPA 211 imposes on service technicians to inspect and repair flue pipes that are not consistent with code.

With that said, it is clear the flue pipes were not attached to each other with screws, as unambiguously required by the Fire Code, and the flue pipe connection to the boiler collar was not fastened in any manner. The State further notes that the consultant retained by the victim's family has opined that the lack of screws in the flue pipe joints connecting one to another, can lead to the pipes shifting and the connection becoming less secure in the event of less severe delayed ignition events.

The only relevant crime to consider in the context of this evidence is a violation of RSA 630:3, Negligent Homicide. Negligence, for purpose of this statute, is criminal negligence, defined as "failing to become aware of a substantial and unjustifiable risk that a material element exists or will result from his conduct." The risk must be of such a nature and degree that the actor's failure to become aware of it constitutes a gross deviation from the conduct a reasonable person would observe in the situation. RSA 626:2 (II)(d).

As a threshold matter, the "conduct" at issue is not an affirmative act, but a failure to act, specifically to take measures to fasten and secure the flue pipe to the boiler collar and conceivably, the flue pipes to each other at each joint. Assuming a failure to act can constitute "conduct" sufficient to support criminal negligence,<sup>17</sup> the analysis proceeds to whether leaving the flue pipe in its unsecured state creates a risk, that because of its nature and degree, represents a gross deviation from what a reasonable person would do. The risk is that an unplanned and uncontrolled ignition event could

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<sup>17</sup> The argument to be made is that failure to act is "conduct." For example, failing to close a gate to a swimming pool when toddlers are present can be characterized as "leaving the gate open." In this case, failing to secure the pipe could be characterized as leaving the boiler in a dangerous condition."

dislodge the flue pipe and fill the structure with smoke of a volume and intensity sufficient to cause death. Consideration of several issues is necessary:

- (a) The "risk," as it has been identified, has existed for a number of years and clearly pre-dated this service technician's involvement with the boiler. That fact leads to a conclusion that the "conduct" at issue was committed by other service technicians. Criminal negligence does not depend on the consequences of a Defendant's conduct. It is the circumstances of the Defendant's conduct that control the outcome. State v. Shepard, 158 NH 743, 749 (2009). If other technicians acted in the same way this technician did, there is a basis for the argument that what this technician did was not a "gross deviation" from what others in the same situation would have done. Further, since the negligence is based on the act and circumstances instead of the consequences, the issue of why this technician is the only one on trial arises.
- (b) As noted above, the NFPA 31 code provision does not explicitly state that the flue pipe shall be fastened with at least three screws or otherwise secured to the boiler. Read together, the provisions applicable to flue pipes contained in NFPA 31 and 211 lead to a reasonable conclusion that fastening the flue pipe to the boiler is mandated. Nonetheless, neither the search warrant affidavit drafted by the SFMO nor any subsequent statement or report by the agency prior to the conclusion made by Inspector [REDACTED] that there was no evidence of negligence or recklessness on the part of the technician alleges that the New Hampshire Fire Code was violated in that manner. The observation was made by Investigator [REDACTED] that the flue pipe had detached from the boiler, but he said nothing further in the affidavit. No citation was issued either to the service technician or [REDACTED] by the SFMO. As noted above, Investigator [REDACTED] has since stated that the lack of fastening screws on the chimney connector was in fact a fire code violation and the technician "may have failed to observe or failed to address this violation." The technician was not asked about the issue during his [REDACTED] 2016 interview. Given these facts, the State would be left to explain why it is

alleging that the technician's failure to become aware of the risk represented a "gross deviation" from the conduct a reasonable person would observe, when the agency in charge of enforcing the fire code did not cite him with a violation for the same failure, or explicitly address it in the investigation.

- (c) The consultant for [REDACTED] would introduce testimony that fastening the flue pipe to this particular boiler would have been impractical if not impossible and that the industry standard was to introduce a "friction fit" flue pipe. The State is not persuaded that the consultant's expected opinion is correct, but combined with the factors above, recognizes that would not be helpful to the prosecution.
- (d) Lastly, for negligence to be criminal, it has to reflect "not only a failure to perceive a more than ordinary risk, but some serious blameworthiness in the conduct that caused it." Id., at 746. As noted above, it is difficult to persuasively argue that the conduct in which others engaged in the identical situation should rest solely with this individual in a criminal context.

The State has determined that a prosecution alleging that failure to fasten the flue pipe to the boiler constituted criminal negligence, under the particular facts and circumstances of this case, would be unsuccessful. Accordingly, the undersigned recommends that prosecution be declined and that the case be closed.

The State further recommends that the appropriate agencies and legislative services consider reviewing NFPA 31 with respect to provisions relating to the attachment, fastening and support of flue pipes to boilers and furnaces with an eye toward eliminating any arguable ambiguity or lack of precision in what is intended to be required. Further, the State notes that Inspector [REDACTED] was correct when he observed that "there are no mandatory licensing laws regulating [the] oil burner repair, replacement or installation trade [and] the adopted codes do not mandate how or what should be tested or replaced during the annual service of [a] boiler and oil burner." The transformer in the unit at issue was not tested, and was old. Given, at best, the apparent lack of a valid combustion efficiency test, consideration should be given to revisiting and/or creating mandated protocols for oil burner servicing, and licensing and training of technicians in the interest of public safety. It likely would not be difficult to establish or conclude that

many New Hampshire citizens, as did Catherine [REDACTED], own "retro-fitted" oil burners with aging components that, if malfunctioning, could lead to life-threatening situations. Minimum mandated, uniform protocols could reduce the likelihood of tragedies such as this one reoccurring.

Dated November 9, 2018

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John A. Bell  
Bar # 382  
Assistant Grafton County Attorney  
3785 Dartmouth College Highway  
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(603) 787-6968

Exhibit 9

**Draft over-the-fire is the most important draft measurement and should always be checked first**

tion caused by the heat exchanger. This restriction, or the lack of it, is a clue to the design and condition of the heat exchanger. A clean heat exchanger of good design will normally cause the breech draft to be in the range of  $-.03"$  to  $-.07"$  when the over-the-fire draft is from  $-.01"$  to  $-.02"$ . The difference between the breech draft and the over-the fire draft is often called the 'draft drop' or 'pressure drop' across the heat exchanger. If the breech draft is  $-.07"$  and the over-the-fire draft is  $-.02"$ , the draft drop is  $.05"$ .

Excessive draft drop may indicate heavy soot and scale deposits in the unit. It is important to understand that over-the-fire draft is indirectly controlled. It is a function, not only of the draft created by the chimney, but also of restrictions in the heat exchanger.

A burner operating at more than zero smoke will cause soot deposits to build in the heat exchanger. These deposits increase the draft drop, lowering over-the-fire draft, reducing combustion air, and creating more smoke. The increased smoke causes even more soot to build up, increasing draft drop even further. The result is a quickly plugged heat exchanger.

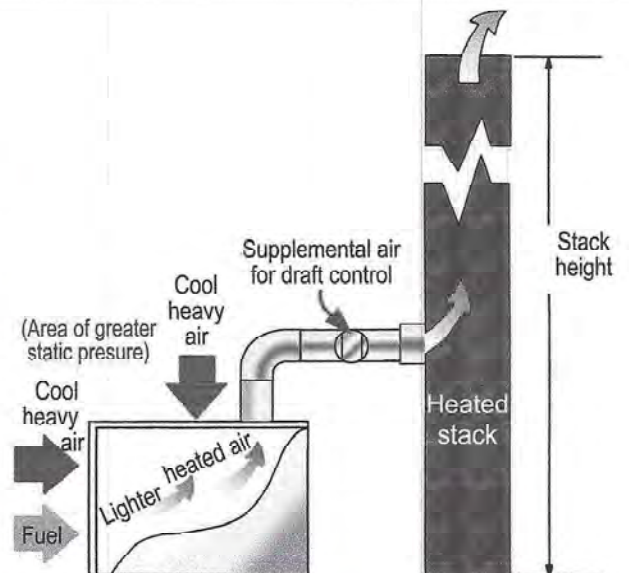
Sometimes there is little difference between the breech draft and the over-the-fire draft, usually with older units originally built for coal. If a boiler measures a low efficiency with a high stack temperature ( $600^{\circ}\text{F}$  or more), it may be possible to install baffles in the heat exchanger passages. However, as with most older equipment, the best alternative is to recommend a new boiler or furnace of higher efficiency.

## Chimney sizing

Proper chimney sizing is important for the safe and efficient operation of all heating appliances. As the requirement can vary depending upon the size and design of

## How draft controls work

Static pressure of the cool air exerts pressure on the outside of the furnace or boiler, the breeching, and flue. The pressure difference between the room air and heated gas (air) causes products of combustion to flow (draft) through the unit and rise through the breeching and chimney. Room temperature air enters through the barometric draft control in the precise amount needed to overcome the excess drafts caused by temperature variations, wind fluctuations and barometric pressure changes. Combustion of fuel is complete and the process is stabilized. The velocity of combustion gases through the heat exchanger is slowed so more heat is extracted.



the appliance, the manufacturer's instructions must be followed.

## Installing flue pipe

Be sure to check the condition of the flue pipe during each service call. If it looks questionable—replace it. The stack temperatures on new high efficiency units are much lower and are more likely to cause condensation and rusting of the flue pipe. This is extremely important because combustion gases can enter the building if the flue pipe is porous or disconnected.

The flue pipe must be at least 18 inches

from a combustible wall or ceiling as a fire prevention measure. It should never be smaller than the flue pipe collar at the breech of the boiler or furnace. The flue pipe should be as short as possible and should not exceed 10 feet of horizontal run unless a draft fan is used. It should have a minimum of 1/4" per foot pitch from the appliance up to the chimney and be run with minimum number of elbows. Use 45-degree elbows instead of 90's when possible.

The flue pipe should be firmly joined with sheet metal screws and supported with straps or wire. It should be tightly fitted to the breeching and installed into a clay or metal thimble that is securely cemented into the chimney. Be sure the thimble and pipe do not protrude beyond the inside wall of the chimney tile.

No sort of dampers, except for the barometric damper (draft regulator) should be installed in the flue pipe or breeching. They are not needed and could cause problems if they close accidentally.

## Chimney and draft problems

Insufficient draft can occur with too many appliances connected to a chimney. Whenever connecting two or more fuel burning appliances to a single chimney, verify that there is sufficient draft for safe operation of all units. Insufficient draft also occurs when obstructions such as soot, loose bricks, birds' nests or other foreign objects build up in the chimney and restrict flow. See Figure 6-7 for common chimney troubles and their corrections.

### Lack of air in the furnace room

Insulation, tight windows and doors, and tight construction can prevent outside air from entering the building. As a result, the building cannot 'breathe.' Oilburner

| Diameter of Flue or Breeching | If Chimney Height Is | Use This Size Control | If Chimney Height Is | Use This Size Control | If Chimney Height Is | Use This Size Control |
|-------------------------------|----------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|
| 4                             | 15' or less          | 4"                    | 16' or more          | 5"                    |                      |                       |
| 5                             | 15' or less          | 5"                    | 16' or more          | 6"                    |                      |                       |
| 6                             | 15' or less          | 6"                    | 16' or more          | 7"                    |                      |                       |
| 7                             | 15' or less          | 7"                    | 16' or more          | 8"                    |                      |                       |
| 8                             | 15' or less          | 8"                    | 16' or more          | 9"                    |                      |                       |
| 9                             | 15' or less          | 9"                    | 16'-30'              | 10"                   | 31' or more          | 12"                   |
| 10                            | 20' or less          | 10"                   | 21'-40'              | 12"                   | 41' or more          | 14"                   |
| 11                            | 20' or less          | 12"                   | 21'-40'              | 12"                   | 41' or more          | 14"                   |
| 12                            | 20' or less          | 12"                   | 21'-40'              | 14"                   | 41' or more          | 16"                   |
| 13                            | 22' or less          | 14"                   | 23'-45'              | 16"                   | 46' or more          | 18"                   |
| 14                            | 22' or less          | 14"                   | 23'-45'              | 16"                   | 46' or more          | 18"                   |
| 15                            | 22' or less          | 16"                   | 23'-45'              | 16"                   | 46' or more          | 18"                   |
| 16                            | 30' or less          | 16"                   | 31'-50'              | 18"                   | 51' or more          | 20"                   |
| 17                            | 30' or less          | 18"                   | 31'-50'              | 20"                   | 51' or more          | 20"                   |
| 18                            | 30' or less          | 18"                   | 31'-50'              | 20"                   | 51' or more          | 20"                   |
| 19                            | 30' or less          | 20"                   | 31'-50'              | 20"                   | 51' or more          | 24"                   |
| 20                            | 30' or less          | 20"                   | 31'-50'              | 20"                   | 51' or more          | 24"                   |
| 21                            | 30' or less          | 20"                   | 31'-50'              | 24"                   | 51' or more          | 24"                   |
| 22                            | 30' or less          | 24"                   | 31'-50'              | 24"                   | 51' or more          | 24"                   |
| 23                            | 35' or less          | 24"                   | 36'-60'              | 24"                   | 61' or more          | 28"                   |
| 24                            | 35' or less          | 24"                   | 36'-60'              | 24"                   | 61' or more          | 28"                   |
| 25                            | 35' or less          | 28"                   | 36'-60'              | 28"                   | 61' or more          | 28"                   |
| 26                            | 40' or less          | 28"                   | 41'-70'              | 28"                   | 71' or more          | 28"                   |
| 27                            | 40' or less          | 28"                   | 41'-70'              | 28"                   | 71' -100'            | 28"                   |
| 28                            | 50' or less          | 32"                   | 51'-100'             | 28"                   | 100' or more         | 32"                   |
| 29                            | 50' or less          | 32"                   | 51'-100'             | 32"                   | 100' or more         | 32"                   |
| 30                            | 50' or less          | 32"                   | 51'-100'             | 32"                   | 100' or more         | 32"                   |
| 31                            | 50' or less          | 32"                   | 51'-100'             | 32"                   | 100' or more         | Two 24"               |
| 32                            | 50' or less          | 32"                   | 51'-100'             | 32"                   | 100' or more         | One 24"<br>One 28"    |
| 33                            | 50' or less          | 32"                   | 51'-100'             | One 32"<br>One 20"    | 100' or more         | One 32"<br>One 24"    |
| 34                            | 50' or less          | 32"                   | 51'-100'             | One 32"<br>One 24"    | 100' or more         | One 32"<br>One 24"    |

When the acid condenses (at about 150 to 200°F), it adheres to the flue pipe and heat exchanger surfaces in a film and reacts with the iron in the pipe and heat exchanger wall. This creates iron sulfates, the light yellow to rust colored crusty scale you find clinging to the heat exchanger.

Scale buildup downgrades efficiency by 1% to 4% over the year. It also blocks flue passages, restricting air flow and increasing smoke and soot. Sulfur levels in heating oil are gradually being reduced, so this will be less of a problem in the future.

## Carbon monoxide

Carbon monoxide, or CO, is a toxic gas that can occur in homes and buildings where combustion by-products are generated, not properly vented and allowed to accumulate. CO is a colorless, odorless, tasteless poison. Carbon monoxide is readily absorbed in the body and can impair the oxygen-carrying capacity of the blood (hemoglobin).

Impairment of the body's hemoglobin results in less oxygen to the brain, heart, and tissues. Even short-term over exposure to carbon monoxide can be critical or fatal to people with heart and lung diseases, and to the young or the elderly. It may also cause headaches and dizziness and other significant medical problems in healthy people. At low concentrations, CO can go undetected and contribute to nagging illnesses, and can compound pre-existing health problems. Figure 7-5.

Carbon Monoxide is a result of incomplete combustion due to unburned fuel. During combustion, carbon in the fuel oxidizes through a series of reactions to form carbon dioxide (CO<sub>2</sub>). However, 100% conversion of carbon to CO<sub>2</sub> is rarely achieved under field conditions and some carbon only oxidizes to the intermediate step, carbon monoxide or CO. Carbon Monoxide

is usually produced by insufficient combustion air. However, excess air and mismatched oil to air patterns and ratios can also reduce flame temperature to a point where CO is produced. So, adding too much air to clean up a smoky fire can create CO. When any part of the flame is reduced below 1,128°F, CO will be produced. Flame impingement also results in lower flame temperature and CO production.

## Ambient CO limits (Recommended)

**0 ppm.** This level is most desirable, but cannot always be achieved due to cigarettes, candles, and appliances such as gas stoves.

**1-9 ppm.**  
Normal levels within the home.

**10-35 ppm.**  
Advise occupants, check for symptoms (slight headache, tiredness, dizziness, and nausea or flu like symptoms), check all appliances, including the furnace, water heater and boiler, check for other sources including internal combustion engine operation in attached garages.

**36-99 ppm.**  
Recommend fresh air, check for symptoms, ventilate the space, recommend medical attention.

## Carbon Monoxide (CO) Levels

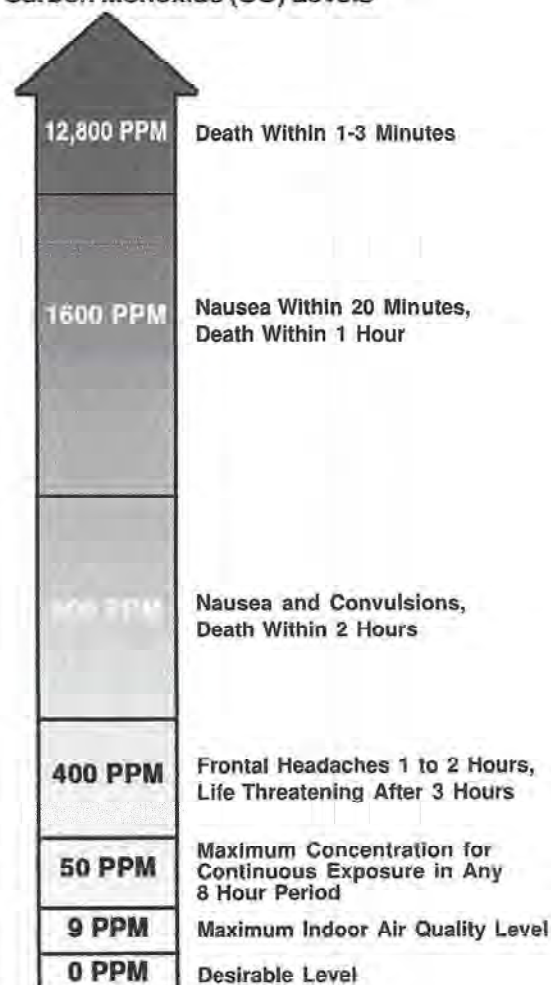


Figure 7-5:  
Carbon  
monoxide levels  
of concern

**100+ ppm.** Evacuate the home (including yourself!) and contact emergency medical services (911). Do not attempt to ventilate the space. Short-term exposure to these levels can cause permanent physical damage.

Carbon monoxide is released into homes by vent blockage, flue pipe damage, heat exchanger cracks, and restricted air supply into the house. This last problem is progressively getting worse as new homes become tighter in their construction, and many homeowners are weather stripping and insulating their older homes.

Most homes have a number of devices such as exhaust fans, clothes dryers, and fireplaces, that remove air from the home. This suction is often stronger than the suction of the heating system's chimney or power vent. This back drafting causes the emissions from the heating system, the water heater, gas ovens, gas stoves, gas dryers, and wood stoves or fireplaces to enter the living area and elevate CO levels.

### Oilheat's CO warning signs

If you see smoke near the burner, dark smoke coming from the chimney, or smell a sharp raw oil smell, the burner is probably producing unacceptable levels of carbon monoxide. With insufficient combustion air, oilburners usually produce elevated smoke levels before high CO levels are reached. This smoke is a warning signal.

The result is that the danger from high CO levels is much lower from oilburners than any other hydrocarbon burner. However, if oilburners are operated with too much combustion air, it chills the flame and creates CO with no smoke! Improper nozzle to air patterning can also produce CO.

### What to watch out for

CO is odorless and tasteless, therefore in

order to detect its presence, we perform combustion tests and look for other clues for combustion or ventilation problems such as:

- Sharp gas or oil smell
- Stale or stuffy air
- Soot, rust, or scale build-up on or around appliances and vents
- Loose or disconnected chimney or vent connections
- Debris or soot falling from chimney, fireplace, or appliance
- Excessive moisture on the inside of windows or walls
- Chalky white powder forming on the chimney or vent
- Visible smoke in the living space

**Light off CO levels:** High CO levels at light off may be an indication of rough or delayed ignition, warranting further investigation. The CO readings will peak on startup, then dramatically drop. CO readings should stabilize within 10 minutes of operation and should never be rising during operation.

**Mechanical problems and CO:** If the appliance being tested has sufficient combustion air and is still producing higher than acceptable CO air-free levels, it could be a mechanical problem.

Inspect the burner for cleanliness, proper alignment, fuel pressures, and evidence of impingement. Impingement occurs when the flame hits an object that has sufficient mass to transfer enough heat from the flame to cause low flame temperatures and incomplete combustion. This can be as simple as a screw poking into the heat exchanger or as major as a collapsed refractory.

Missing burner covers, improper air band adjustment or oil pressures can also contribute to higher than normal CO levels.

After the transformer was replaced with an identical Iron Core transformer, further testing identified that the burner-boiler operated correctly with no failure present.

Combustion parameters were verified with the use of a Bacharach spot smoke test hand pump as well as a Testo model 310 combustion analyzer.

### Conclusion

The failure of the oil burner as well as the delayed ignition explosions were caused by the failure of the oil burner's ignition transformer which in our opinion caused the connector pipe between the boiler and the chimney to become dislodged.

This was also reiterated by an expert hired by State Attorney John Bell. In Mr. Bell's report dated 16 October 2018, he states that his expert [REDACTED] was adamant that a friction fit of smoke piping was not acceptable.

The failure of the ignition transformer allowed incomplete combustion, which in turn allowed oil to spray into the combustion chamber in an unburned condition where it accumulated. At some point, combustion resumed which in turn, ignited this accumulated fuel resulting in soot production as well as a sequence of delayed ignition explosions. This is a common occurrence in the malfunction of oil burners.

The design of this boiler was one where the connector pipe between the boiler and the chimney was a side mount design. This prevented the connector pipe from being the benefactor of gravity in that the connector pipe did not sit on top of the boiler in a rested condition, but rather, was reliant upon the connection where the boiler's connector pipe fastened to the cast iron boiler side collar. There also were no supports or hangers used to support this piping.

On the other end, the connector pipe was inserted into the chimney thimble and should have been sealed with furnace cement.

The [REDACTED] Fire Department reportedly found the connector pipe on the floor and broken at an elbow location.

### **Likely Effects if Properly Fastened**

Had the connector pipe been properly secured to the boiler and each section secured to each other with three sheet metal screws as required by NFPA code, the NORA Technicians Manual as well as standard practice of trade, it would have been more likely than not resilient to the effects of a delayed ignition event.

With the connector pipe simply held in place with friction interface forces at each pipe joint as well as onto the boiler collar, that made this portion of the boiler system susceptible to vibration and delayed ignition events which should be expected in the potential life of an operating boiler.

Furthermore, if the delayed ignition event caused the 90 degree elbow component of the connector pipe system to separate as reportedly is opined by experts working on behalf of Irving Oil, if the ends of the connector pipe were secured as well as the piping properly supported and each individual section secured with sheet metal screws as directed by these guidelines, it is our opinion with a reasonable degree of engineering certainty that the connector pipe would have more likely than not stayed in an

orientation allowing the proper passage of most of the combustion gases from the system as opposed to all of the products of combustion from the boiler discharging into the home as a result of the total separation of the connector pipe from the boiler.

It should be remembered that not only was the fluepipe connection to the boiler not secured with sheet metal screws as directed by NFPA and NORA guidelines (References F-H) but in fact ALL of the connector pipe joints were without fastening screws. In this condition, the friction connection of ALL of the pipe joints would be more susceptible of being compressed together thereby shortening the effective overall length of the smoke-pipe. This, in turn would act to reduce the horizontal force of the connector pipe against the boiler's flue collar further diminishing the connections force onto the boiler enhancing its ability for detachment from the appliance.

Our testing of the boiler during our September 2018 evaluation resulted in a delayed ignition event HOWEVER the exemplar elbow did not separate contrary to the theory of opposing experts. As such this demonstration as well as the consideration of the mechanics of the installation provide us with the opinion that the separation of the elbow is in our opinion the result of the connector pipe falling to the floor.

### **Existing Guidelines and Guidelines from Code, Technicians Publications and Standard Practice of Trade**

Documentation in the form of code guidelines, manufacturer's instructions and maintenance publications are readily available and provide direction as to the best and safest practices for the maintenance of heating equipment such as that involved in this loss. Also, if in question, the Jurisdiction Having Authority (the code enforcer) can be queried.

Although code directive initially addresses new installation, the intent of the installation code, that being in assuring the safest operation of the equipment, should be realized along with the responsibility of the repairing technician to incorporate these practices to assure safety to the equipment being serviced.

In this case, when the choice was made whether the directive that "all ventilation pipes be secured by sheet metal screws" includes the piping joint which affixes it to the appliance, in the spirit of the code and in the interest of best practices, the choice that upholds the safety of the public as opposed to the convenience of the repair technician is to secure all ventilation piping joints including the boiler connection.

Furthermore, incorporating installation and maintenance actions, after the removal and cleaning of the ventilation piping during maintenance actions, this portion of the heating equipment is in fact being **reinstalled** allowing the intent of the code to be executed by securing the ventilation piping in accordance with current code direction.

### **Existing Code Guidelines:**

#### **A- NFPA 31 Provisions Regarding Code Intent and The Ventilation of Combustion Gases Attachment F**

Subsection 1.2 (entitled "Purpose") states "The purpose of this standard is to provide minimum requirements for the safe installation of stationary liquid fuel-burning appliances and all related accessories **so as to prevent fires and explosions.**"

Subsection 6.1 under the heading "Venting of Combustion (Flue) Gases" provides that "This chapter shall apply to those requirements necessary to ensure the safe venting of combustion and flue gases from oil-burning appliances and equipment."

Subsection 6.5.13 under the heading "Chimney Connectors" provides that "The chimney connector shall be securely supported."

Subsection 6.5.14 under the heading "Chimney Connectors" provides that "each joint of the chimney connector shall be fastened together with at least three screws." This is also stated in Attachment H, the NORA Oilheat Technicians manual.

## **B- NFPA 211 Provisions Regarding Code Intent and The Ventilation of Combustion Gases Attachment G**

Although most code guidelines address installation requirements, there are some that address maintenance requirements directly as is the case with NFPA Section 211 Standard for Chimneys, Fireplaces, Vents and Solid Burning Appliances.

As seen in subsection 1.1 under the heading "Administration" provides that "This standard applies to the design, installation, **maintenance**, and inspection of all chimneys, fireplaces, and venting systems, and solid fuel burning appliances."

Subsection 1.2.1 under the heading "Administration (which is entitled "Purpose") provides in pertinent part that "The primary concern of this standard is the removal of waste gases," This subsection expressly provides that it applies to "venting systems" including those located in residential structures.

### **Chapter 14 of Section 211 is entitled "Maintenance".**

Subsections 14.2 and 14.2.1 together provide that vents shall be inspected annually, and that "... cleaning, repair and maintenance ..." of the vent "shall be done if necessary."

Subsection 14.7.2 provides that inspections of vents shall comply with the Level II requirements for an inspection, including in accordance with Section 211, subsection 15.4.

Subsection 14.8 provides that "When inspection ... shows that an existing ... vent is damaged, unsuitable or improperly sized, it shall be repaired, rebuilt or resized to the construction and functional requirements of this standard."

### **Retroactive Application of the Code**

Direction is provided from NFPA 211 that the code is to be applied retroactively for existing systems.

**Subsection 1.3.1 under the heading "Administration" provides that "... where specified, the provisions of this standard shall be retroactive."**

Subsection 9.2.2 provides that "Connectors for residential-type appliances shall conform to the requirements of this chapter."

Subsection 9.7.9 provides that "Connectors shall be supported, and joints fastened using sheet metal screws, rivets or other approved means."

### Existing Maintenance Publication

C- NORA Oilheat Technicians Manual Pg. 6-10, 14-7, 14-8. (Attachment H).

"The flue pipe shall be firmly joined and supported with straps or wire. It should be tightly fitted to the breaching and installed into a clay or metal thimble that is securely cemented into the chimney."

"Double check the flue pipe is secured with sheet metal screws and supported."

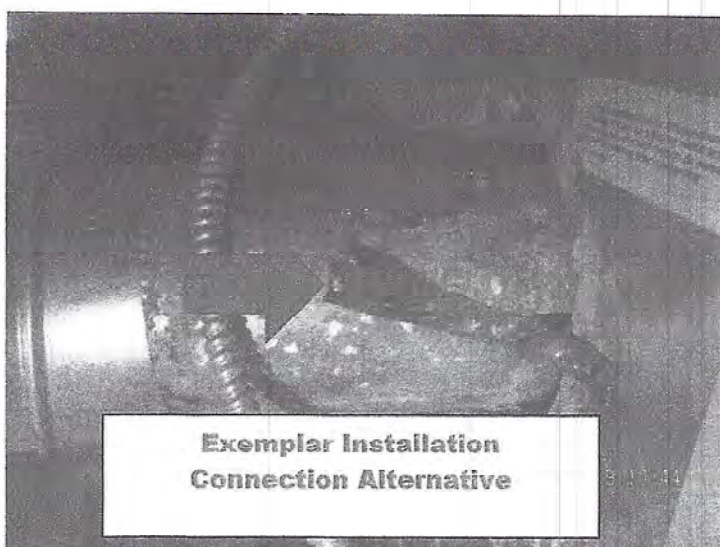


### Alternative Installation of Smoke Pipe Arrangement

ISE Engineering investigates various forensic engineering failures with a large majority of these being in the area of heating equipment failure analysis.

One way to secure the smoke pipe to the cast boiler flange would be by drilling screw holes or using self-tapping screws.

As seen in accordance with Attachment E to this report, as well as this photograph of an exemplar boiler installation, a commonly observed alternate fastening method for connector pipe to boilers when access to the connection flue is not possible is the use of metal straps which hold the connector pipe to the boiler collar.



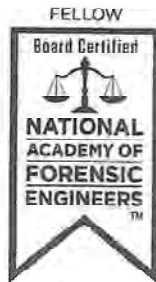
It is our opinion beyond a reasonable degree of engineering certainty that the failure of the boiler and the resulting delayed ignition event that caused the smoke pipe to become dislodged on J [REDACTED] 2016 at [REDACTED], NH would have been prevented or reduced in its severity had the connector pipe between the boiler and the chimney been secured in accordance with NFPA, NORA and standard practice of trade used in the heating industry.

If I can be of any further assistance, please do not hesitate to contact me at my office at (508) 226-8800.

Sincerely,



John P. Certuse P.E., CFEI  
Director of Engineering  
ISE Engineering, Inc.



[REDACTED]

1073

Since we were instructed that a non-destructive procedure would have to be followed which prevented me from measuring the fuel oil pump pressure, remove the draw assembly (electrodes and nozzle), test the ignition transformer and possibly test fire the oil burner itself which was the purpose of the inspection. However, all was not lost as a number conditions revealed themselves during my physical inspection.

1. Burner air band was completely closed preventing the proper adjustment of the oil burner as prescribed in the Beckett Installation Manual page 19. The Secondary air shutter was set at #6 (approximately 1&1/8<sup>th</sup> inch) which under normal condition would not support a firing rate of 1.00 gph. The photo also indicated that there is a heavy accumulation of soot on and around the lower portion of the fuel pump and secondary air shutter.
2. The burner "Z" dimension may have been incorrectly set for the correct firing rate but unfortunately, I was unable to verify this at the inspection. This will have to be measured upon further inspection which I understand is to be conducted by ISE later.
3. Inspection of the burner head revealed the head to be clean but the nozzle and both electrodes were heavily coated with soot / unburned fuel. It was also noted that the electrode settings exceeded the recommend setting of 5/32".
6. With the approval of all parties the ignition transformer (10kv) was flipped back from the burner housing to reveal the motor housing and blower wheel. This was not considered a destructive inspection. The nozzle/electrode assembly was covered with soot as was the burner housing, blower wheel, wiring, transformer base and springs clearly indicating the oil burner was not operating in a safe and efficient manor which may have led to a delayed ignition causing the chimney connectors (flue piping) to separate from each section but also the boiler.

Since no further inspection could be done of the burner due to the restriction placed on participants the burner was repackaged, sealed and signed to preserve the chain of custody.

The sections of flue piping were then inspected and photographed by all interested parties. The following was observed during my inspection;

1. No drill or screw holes were found in any of the sections of flue pipe including the barometric flue damper clearly indicating that the flue piping (chimney connector) was never properly fastened together with at least 3 (three) screws as per NFPA 31 Section 6.5.14.
2. Given the condition of the chimney connectors it appear that they were never securely supported as required by NFPA 31 Section 6.5.13.
3. The interior of the chimney connectors should a minimal amount flue gas corrosive material with little soot accumulation.

4. A 5/16" diameter hole was in the section of flue pipe between the barometric flue damper and an elbow which would have been attached to the boiler. The hole is used to perform combustion efficiency test such as flue gas temperature, smoke reading, draft, CO<sub>2</sub>, O<sub>2</sub>, and CO.

Unfortunately, the location of the test hole is not in the correct location as it is too close to the elbow which will give incorrect readings due to turbulence created by the elbow.

**Conclusion:**

Although the goal to test fire the oil burner and ultimately disassemble it for determining the cause of the malfunction (delayed Ignition) which led to the flue connectors to become dislodged from the boiler and the chimney base I was able to substantiate my earlier assessment of the conditions which led to the incident in [REDACTED] NH on [REDACTED], 2016.

Based on the physical evidence obtained by the inspection of the oil burner, chimney connector and printed material made available it is evident that the cause of this unfortunate incident could have been prevented had the appliance been properly setup and adjusted with the proper use of a calibrated combustion testing instrument and the proper interpretation by the service technician of the information provided by the instrument.

With reference to additional printed material provided earlier in my investigation on a Service Work Order dated 8/10/15 written by [REDACTED] the combustion efficiency test is different from the readings produced by the testing instrument. In the written document the stack temperature considerably higher which has not been explained. It also indicates draft readings which do not appear on the paper from the testing instrument.

It was also noted that the dates and times were altered on the test papers from the test instrument. This too sent up a red flag.

Secondly, had the chimney connector (flue piping) been properly secure to the appliance (boiler) and securely supported as per NFPA 31 Section 6.5.13 and 6.5.14 the delay ignition would have had a different outcome.

One other concern that I was unable to verify during the inspection was the actual firing rate of the oil burner (nozzle size). If it is a 1.00 gph nozzle as per the service technicians report it should be noted that the boiler has a recommended fire rate of 1.50 gph and with the lower nozzle size this boiler was grossly under fired and inefficient.

[REDACTED]

5/27/2021

To whom it may Concern:

My name is Peter Ripaldi, I am currently the owner of Ripaldi Home Inspections and past co-owner of Ripaldi Construction Services of 30 + years. I am also a longtime friend of Gary Braun and he asked me to share my experiences in regard to what I have seen over the years regarding furnaces/ boilers and flue pipes.

Currently I inspect 250-350 homes per year and I am surprised at the amount of flue pipes that I inspect that are fastened incorrectly, and many of them have recent service tags on them. It appears that most of the technicians are adequately installing the 3 screws per joint except at the furnace/boiler flange and into the chimney flu collar itself. There are some weeks that I can see 4 or 5 incorrect installations. In many instances I can easily detach the flue pipe with little force. Occasionally I will run into a detached flue pipe that is not sitting in or on the flange at all. This tends to especially be a problem with older furnaces and boilers. In any of these instances, I treat it as a safety issue and recommend that a technician be called to properly screw and seal the pipes.

In most cases the fix is simple and very inexpensive, I would guess under \$1.50. A few screws and some metal hanger strapping would prevent accidental detachment from delayed ignitions, blowback, bumping, or vibrations.

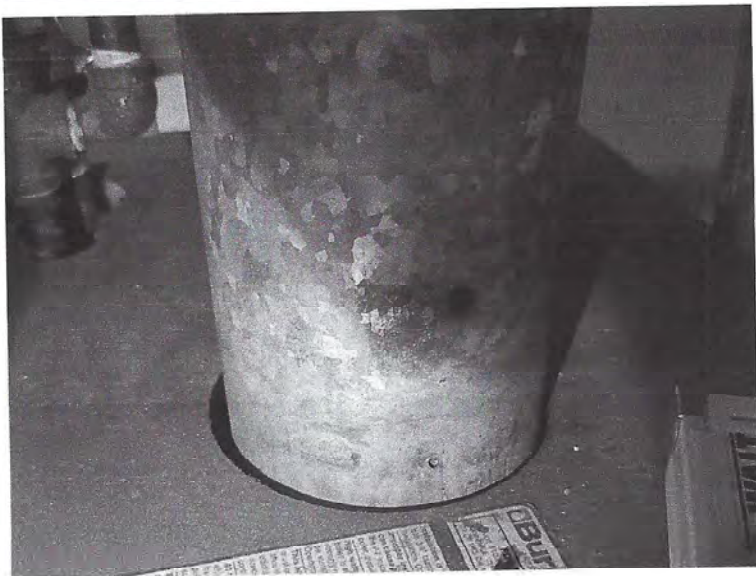
After hearing about Gary's mom, I have really paid attention to this detail and find it widespread. It is evident in both gas/ oil furnaces, boilers, and hot water heaters. I'd estimate that about a third of the oil furnaces/boilers that I see during home inspections in NH do not have screws or another type of fastening system to hold the pipe to the flue collar. I feel that the NFPA needs to address this issue by revising and clarifying the Code on maintaining venting systems.

I have attached a few pictures from recent inspections for reference.

Sincerely,

Peter Ripaldi

Ripaldi Home Inspections ([inspectorforyou.com](http://inspectorforyou.com))





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May 20, 2021

National Fire Protection Association  
Section 211 Review Committee  
1 Batterymarch Park  
Quincy MA 02169-7471

**Subject: Public Comment on Section 211 of the NFPA Code Re: Attachment of Connector Pipe to the Flue Collar on Oil-Fired Heating Devices**

Dear NFPA 211 Committee:

My name is John Certuse and I am a licensed Oil Burner Technician as well as a Pipe Fitter and Fire Investigator and I am also a licensed Professional Mechanical Engineer. I was also on the NFPA 31 committee in the mid 1990's.

As the president of ISE Engineering, Inc., a forensic engineering investigation firm that investigates failures in heating systems and other equipment for the insurance industry, I have seen many failures of heating appliances such as the one Mr. Gary Braun had engaged me to investigate.

In my role as a Forensic Investigator, I have investigated thousands of heating system failures that have resulted in fires and explosions, as well as building damage and product of combustion discharge damage to the interior of homes.

The issue at hand is an ambiguous direction in NFPA 211 that, in my opinion, requires clarification.

In the strictest meaning of my interpretation of the code, the need for metal fasteners between connector pipes, between the appliance and the chimney is clear. However, the specific need for fasteners where the metal stove pipe connects to the appliance collar itself (be it a boiler or furnace), is in my opinion, not specific enough.

In my role as a forensic investigator, I have seen delayed ignition and other events cause detachment of the connector pipe to the appliance collar, which has resulted in carbon monoxide and product of combustion discharge into the interior of homes, sometimes with fatal results.

I have testified in approximately 100 trials and depositions and in the cases that I have been involved in, there appears to be some confusion as to the difference between the joints in question being the "pipe to pipe" joint as opposed to the pipe to "appliance collar" joint. I am of the opinion that clarification and direction in this area is needed.

In cases where there may be a mechanical interlocking or fastening system approved by regulatory bodies, I am of the opinion that the manufacturer takes responsibility for that issue. However, in conventional appliances where the connector pipe is a typical pressure fit connection, sheet metal screw fasteners in my opinion, should be specified not only for the "pipe to pipe" connection but also to the "pipe to appliance" joint pipe connection, as well.

In the event of a delayed ignition occurrence, the pressure wave that the flue passageways and firesides of the boiler and connector pipe experience, is applied to all of the connections including the appliance flue pipe connection at the collar.

As such, I am of the opinion that the need for sheet metal fasteners applies to all of these connections.

I am of the opinion that this is not a burdensome request, since flue collars are typically constructed of a sheet metal design or in some cases, a cast iron collar as well. In the latter of these, a cast iron collar can also have metal fasteners connected to it either by predrilling or using self-tapping screws, securing the boiler connector pipe to the appliance collar.

Another method that I have seen installers use in the field, is the use of metal strapping that bridged the gap between the connector pipe and the appliance, with sheet metal fasteners being secured in to the connector pipe and boiler or furnace jacket.

Some manufacturers even incorporate this type of fastener design in their appliances by providing extension tabs as part of the appliance.

Nevertheless, the importance of addressing this crucial connection between the boiler and connector pipe is something that must be addressed in greater detail.

Another reason that I am of the opinion that the NFPA 211 as well as other supporting codes should address this, is that there are still many appliances that exist that due to the conditions over time, no longer have installation instructions available or have installation and maintenance instructions that are incomplete without a clear direction as to this issue.

I worked with Mr. Gary Braun after a tragic event had occurred in his mother's home in which a dislodged connector pipe from the appliance allowed products of combustion to enter into the home, which in turn, led to the passing of his mother. I am of the opinion that this tragic event could have been avoided.

Mr. Braun's proposed revision of subpart 9.7.12 (2) establishes a clear baseline standard that will protect people from being seriously injured or killed due to the dislodgement of connector pipes, which is obviously causing some confusion and disagreement between heating system technicians maintaining this equipment.

Page – 2  
National Fire Protection Association  
Section 211 Review Committee  
May 20, 2021

As someone who has been intimately involved in the direct physical assessment of heating system failures for over 30 years, I feel that I have a unique view as to occurrences that are resulting due to present maintenance and installation standards and it is for this reason that I wrote "Heating Systems Troubleshooting & Repair" published by Industrial Press Publishers, in an effort to provide some additional guidance to the heating industry.

Again, the failure identified is not something that I have seen just in this one particular instance involving the Braun family but rather, something I have seen on a routine basis.

If I may provide you with any additional assistance, please feel free to contact me.

Sincerely,



John P. Certuse P.E., CFEI  
Director of Engineering  
ISE Engineering, Inc.





# State of New Hampshire

GENERAL COURT

CONCORD

REP. ISRAEL F. PIEDRA  
israel.piedra@leg.state.nh.us

May 21, 2021

National Fire Protection Association  
Section 211 Review Committee  
1 Batterymarch Park  
Quincy MA 02169-7471

**RE: Requested Amendment to Section 211**

Dear Members of the Committee:

I am a member of the New Hampshire House of Representatives and have represented Hillsborough District 9 (Manchester, Ward 2) since 2018. I am also a practicing attorney. This letter serves as a formal submission of comments to the Committee with regard to Section 211 of the NFPA Code.

In short, I believe that Section 211 should be revised so that it unambiguously mandates the use of screws or fasteners (or some functional equivalent) on connections between vent pipes and flue collars on oil-fired heating devices. Specifically, I endorse the proposals set forth by Mr. Gary Braun in his comments to the Committee on this subject.

I first became aware of Section 211 in connection with a civil lawsuit related to the death of Mr. Braun's mother. I will not repeat the details of Mrs. Braun's death here, as I understand they will be described in Mr. Braun's letter. In short, however, Mrs. Braun died after a "blowback" event from her oil-fired boiler caused a vent pipe to dislodge from the boiler. As a result of the dislodged pipe, deadly carbon monoxide gas vented into the home, killing Mrs. Braun.

My firm represented the estate of Mrs. Braun in that matter. Through my involvement in that case, I came to believe that the language of Section 211 should be amended and clarified.

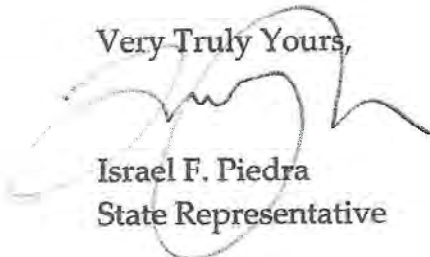
The litigation (and related criminal investigation) demonstrated that there exist wildly divergent interpretations of the language in question throughout the industry. This is a problem in and of itself. But it is particularly a problem because the ambiguity can result in loss of life.

Simply put: it is my belief that Mr. Braun's mother would not have died had screws/fasteners been used on the boiler's flue collar in her home. The use of screws or similar fasteners would have been an easy and inexpensive task to perform. Yet it was not done, because the relevant actors did not believe the Code required it. As a result, the boiler's vent pipe was easily blown off the boiler's flue collar during the blowback event, leading to Mrs. Braun's untimely death from carbon monoxide poisoning.

The changes recommended in Mr. Braun's letter would eliminate confusion and protect the public at virtually no cost to industry actors. I therefore urge the Committee to clarify Section 211 in order to avoid further preventable deaths like Mrs. Braun's.

If I can provide any further information regarding this matter, please do not hesitate to contact me.

Very Truly Yours,



Israel F. Piedra  
State Representative

May 24, 2021

National Fire Protection Association  
Section 211 Review Committee  
1 Batterymarch Park  
Quincy, MA 02169-7471

**Re: Public Comment on Section 211 of the NFPA Code Re: Attachment of  
Connector Pipe to the Flue Collar on Oil-Fired Heating Devices**

Dear Members of the Committee:

I am writing in support of the effort by Gary Braun, Esquire, to effect revisions of NFPA Section 211 to unambiguously mandate the use of screws, band iron fasteners or other equivalent measures when attaching a chimney connector flue pipe to the flue collar of an oil-fired boiler, particularly an older model for which manufacturer installation and servicing recommendations are not available.

I agree with Mr. Braun that a significant difference of opinion exists within the oil burner servicing industry, as well as its regulatory and certification personnel, with respect to the interpretation of existing regulatory language in NFPA Section 211. From my personal perspective, based upon what I learned in the course of my involvement in the review of an investigation of a carbon monoxide fatality, the differing interpretations frustrate establishing a clear duty of care on the part of oil burner installers and service technicians and a bright line industry standard instrumental in safeguarding the lives of our citizens.

I

I was assigned by the Grafton County Attorney to review an investigation conducted by the New Hampshire Office of the State Fire Marshal (SFMO) into the death of an elderly woman in her single-family home following a malfunction of her oil-fired boiler. The cause of death was carbon monoxide poisoning. The preliminary investigation revealed that a delayed ignition event resulted in concussive force within the boiler system significant enough to dislodge the flue pipe from the flue collar of the boiler, as well as other sections of the flue pipe assembly.

The victim was located by a firefighter who entered the home wearing a SCBA. In his report, he noted that he located the victim by feel because black smoke had filled the residence, obstructing his vision. A neighbor told investigators that his efforts to enter the victim's home were thwarted by the heavy smoke.

II

The investigation, and its ensuing review, were focused on two areas: (a) attempting to identify the cause of the delayed ignition event and (b) whether the attachment of the flue pipe constituted a violation of the Fire Code, which at the time had adopted NFPA Section 211 (2009).

In an SFMO report issued subsequent to the referral of the case to the Grafton County Attorney, an investigator noted that fastening screws were missing from the smoke (vent) pipe, the vent system separated at the elbow seam and "not at any of the joints of which the galvanized pipe (*sic*) was connected to each other." The report, and indeed the entire investigative file, was silent on the issue of whether the attachment of the flue pipes to each other and/or the boiler flue collar was code compliant.

I note here, as I did in my November 19, 2018 report, that there exists no dispute that the connector pipe linking the boiler to the chimney was unfastened and unsecured on the boiler collar. The servicing company, the service technician and experts consulted and retained by the company maintained that a "friction fit" or "force fit" that was employed on the boiler connection at issue was code compliant.

George Kusterer, who has decades of experience installing and servicing oil-fired boilers and who has served with distinction on the NFPA Board, was retained by the State as a consultant. Mr. Kusterer served on the NFPA 31 Committee. He was adamant that NFPA 31 requires chimney connectors to be supported and attached and flue pipes to be supported by at least three screws per joint. The provision of NFPA 31 to which Mr. Kusterer referred does not explicitly mandate three screws attaching the flue pipe to the boiler collar, but it does call for the pipes to be secured, fastened and supported. Mr. Kusterer explicitly rejected the notion that a "friction fit" or "force fit" of the chimney connector to the boiler achieved compliance with the provision.

At the time of my report referenced above, I was aware of the position of the company's retained expert that the industry standard in New Hampshire was that a "friction fit" or "force fit" of the connector pipe to the boiler flue collar was sufficient and satisfied code requirements. I have since learned, through Mr. Braun's written comment, that the company retained a second expert, a NORA instructor at a New Hampshire trade school who trains and certifies New Hampshire oil burner service technicians. According to Mr. Braun's comment, not only did this individual opine that a friction or force fit of the flue pipe to the flue collar was the industry standard, but that in more than forty years of practical experience, he has never encountered another method of attaching the chimney connector to the boiler. (See Mr. Braun's comment, Section VI.)

Mr. Kusterer, while assisting the State with this case three years ago, provided case facts related to a delayed ignition event in Maxatawny Township, Pa., involving a boiler manufactured in 1977, which, like the boiler at issue here, was retro-fitted with a high-speed retention head burner in 1992. Photographs of the unit show the chimney connector attached to the flue collar with screws and supported by band iron. (See 11/9/2018 report, Exhibit 16). The vent pipe did not dislodge from the boiler during the event.

As my case review was nearing completion, I specifically asked the SFMO lead investigator in writing whether the SFMO took the position that a failure to fasten the flue pipe to the boiler collar constituted a violation of the fire code. He responded that the chimney connectors, defined as the pipe that connects the fuel burning appliance to

the chimney "was not secured with three screws at the connections, thereby being non-complaint with the Fire Code." No citation was issued in the case.

### III

I defer to Mr. Braun and his consultants regarding the specific sections of NFPA regulations that should be amended. I do not attempt to present to the committee as an expert in the oil burner industry or regulations governing it. I did witness first-hand the inconsistency in interpreting and even enforcing this critical component of the Fire Code.

I concur with Mr. Braun that Section 211, Subpart 9.7.9 should be more explicit. Not only is the term "joint" undefined, as Mr. Braun points out in his submission, the language directing that "joints being fastened using sheet metal screws, rivets or *other appropriate means* (emphasis supplied) is ambiguous and breathes life into the "fiction fit" or "force fit" argument."

I also agree with Mr. Braun that the intended target of the revisions should be heating units for which no manufacturer's recommendations or manuals are available.

The bottom line is that unsecured chimney connections in older oil-fired boilers and the reliance on a perceived industry standard of a "force fit" or "friction fit" method poses a clear threat to the lives of our citizens, particularly seniors who are perhaps more likely to own older and retro-fitted systems for which no manufacturer's directives exist.

The death that occurred in the case I reviewed was preventable. In all fairness, the ambiguity and inconsistent interpretations by qualified experts ruled out a sensible conclusion that a criminal act occurred under the existing law. The burden placed upon the industry generally, or companies and technicians specifically, to inspect the vitality and safety of those critical connections in the context of bright line standards and explicit regulations, is in my opinion, negligible, and far outweighed by the societal benefit of helping to eliminate a deadly threat to our citizens.

I appreciate having the opportunity to share my thoughts with you.

Sincerely,

*/s/ John A. Bell*

John A. Bell  
Former Assistant Grafton County Attorney  
NH Bar # 382  
PO Box 108  
North Haverhill, NH 03774

May 27, 2021

National Fire Protection Association  
Section 211 Review Committee  
1 Batterymarch Park  
Quincy MA 02169-7471

**RE: Public Comment on Section 211**

Dear Ladies and Gentlemen:

My name is Roland C. Abbott. I'm writing in support of Gary Braun's attempt to revise NFPA Section 211.

I own and operate a heating installation and servicing company in northern New Hampshire, and have been involved in the oil-heating business for about 34 years. I currently hold a NORA Gold certification and a N.H. voluntary oil technician certification. Following his mother's death in 2016, my company was employed by Mr. Braun to work on and eventually replace the heating system at his late mother's home. The system in place at the time of her death was a Utica boiler from the 1960's with a side mount, cast iron breech. It was retrofitted with a new burner assembly sometime in the 1990's. In early 2016, the burner's ignition transformer malfunctioned and caused a delayed ignition event. The connector pipe was blown completely off the boiler onto the basement floor releasing carbon monoxide into the home. I'm aware that no screws, straps or other fasteners were used by the company that serviced the boiler prior to the 2016 incident to hold the connector pipe onto the boiler's breech, or, to hold the pipe sections together.

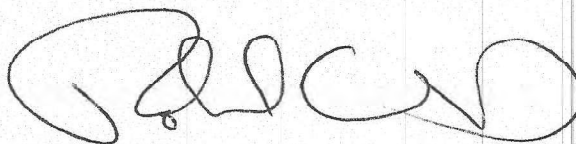
I've read some of the materials submitted by Mr. Braun in support of his request to revise Section 211 including his letter to NFPA, and the reports from the service/installer from Massachusetts and the NORA instructor from NH. I cannot state how strongly I disagree with the notion that a friction fit should ever be used as the only means to attach the connector pipe to the breech on any heating device, including an oil boiler. Making sure that the attachment point where the connector joins the breech is absolutely secure is one of the most basic rules that needs to be followed by someone installing or servicing a heating system. Using a friction fit and nothing else is a dangerous and totally unnecessary practice. I have instructed my install and service techs to always use screws, fasteners or other some other method of fastening the pipe to the breech. We NEVER use only a friction-fit at the breech. Especially if the flue pipe is not a tight fit on the cast-iron breeching.

As pointed out by Mr. Braun, part of the problem here is that there are many older oil systems in service today that don't have manufactured systems to attach the pipe to the breech. It's also true that the manufacturer's instructions for attaching the pipe to the breech

are not available when servicing many, older heating systems. Mr. Braun is correct in my opinion that Section 211 should provide a floor or baseline standard for attaching the pipe to the breech including when a heating system is serviced per Section 211.

It seems that there is significant disagreement in the industry at present about Section 211's requirements for attaching the connector to the breech. I agree with Mr. Braun that Section 211 should be clarified or revised to clearly require more than just a friction fit at the breech. It is fine if a secure connection at the breech is accomplished via the manufacturer's system for attaching the pipe to the breech. But at minimum, the manner of attaching the pipe to the breech as required by Section 211 should require use of screws, fasteners or something else which provides equivalent protection against the pipe becoming dislodged from the breech. Thank you.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Roland C. Abbott', with a large, stylized initial 'R'.

Roland C. Abbott

Roland C. Abbott Plumbing & Heating LLC.

May 28, 2021  
**REVISED VERSION**

National Fire Protection Association  
Section 211 Review Committee  
1 Batterymarch Park  
Quincy MA 02169-7471

**RE: Public Comment on Section 211 of the NFPA Code Re: Attachment of Connector Pipe to the Flue Collar on Heating Devices Including Oil-Fired Heating Devices**

Dear Members of the Committee:

I submit this comment with respect to NFPA Section 211 regarding the method of attaching venting systems serving heating devices, including oil-fired heating devices. Specifically, it is my belief that Subpart 9 of Section 211 should be revised for the reasons described in this comment.

This comment was originally submitted on or about May 28, 2021. It is being resubmitted at this time at the request of NFPA in order to exclude exhibits that I do not have copyright permission to post publicly. Various exhibits were submitted by me in support of this comment, including in order to demonstrate the disagreement within the oil-heating industry regarding the manner of attaching the vent or connector pipe to the flue collar on oil-fired devices. Should anyone want a copy or copies of any of the exhibits to this comment, they may contact me and I will provide the exhibits requested. My contact info is shown at the end of this comment.

I. Introduction and Background Facts

My mother (whose nickname was “Kit”) died in 2016 in New Hampshire from carbon monoxide asphyxiation when the burner on her home’s oil-fired boiler (hereafter the “Boiler”) malfunctioned, causing a delayed ignition event (the “Event”).<sup>1</sup> The concussive blast from the Event dislodged the entire, galvanized-steel connector pipe assembly (the “Connector”) from the Boiler, and the Connector fell onto the basement floor breaking into 2 pieces.<sup>2</sup> Please see **Exhibit 1** accompanying this comment which shows a photo of the Boiler and Connector taken shortly after the Event.

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<sup>1</sup> A delayed ignition event occurs when un-combusted, liquid oil accumulates in the combustion chamber and/or the blast tube of an oil burner because the oil fails to ignite when heat is called for by the thermostat. In the case of my mom’s Boiler, it was determined via subsequent testing of the Boiler’s burner assembly that the ignition transformer failed, thereby causing the Event.

<sup>2</sup>The sections of pipe themselves did not come apart, though the manufactured elbow on the Connector did fail at a riveted seam, likely as of result of falling onto the basement’s concrete floor.

My mother employed an oil-servicing company (the “Company”) for appx. 6 years before the Event to perform annual maintenance on the Boiler; an activity which is expressly regulated by Section 211, including by Subparts 9 and 14. The Boiler was last inspected and serviced by the Company in the summer of 2015, about 6 months prior to the Event. It was a Utica model manufactured and installed around 1966, with a cast iron flue collar located on the back side of the Boiler (i.e. a so-called “side-mount” system). The Connector appeared to be properly connected to the thimble and chimney at the time of the Event. However, no sheet metal screws, strapping, or other fasteners were used by the Company and its service tech to fasten together the separate pieces of galvanized pipe making up the Connector. During the time the Company’s tech serviced the Boiler, the tech was trained under and certified by the North American Oil Resource Association (“NORA”) per NORA’s Silver oil-technician educational and certification process.

Likewise, and critically, no screws, straps or other fasteners were used by the Company to connect and fasten the Connector to the flue collar on the Boiler, including at the time of the 2015 service call prior to the Event. Instead, the Connector was attached to the flue collar via a “friction-fit” or “force-fit” where the Connector pipe was simply shoved or placed onto the collar. In fact, no fasteners of any type were ever used by anyone servicing the Boiler prior to the Event in order to attach the Connector to the collar on the Boiler. The fact that the Boiler was a side-mount meant, among other things, that gravity assisted in dislodging the Connector from the flue collar during the Event.

As would seem to be the case with the vast majority if not all older, oil-fired boilers, the Boiler did not have an interlocking or other manufactured system to secure the Connector to the collar. Unsurprisingly, the Utica manufacturer’s manual was not with the Boiler at the time of the Event and was not subsequently located. It was never conclusively determined whether Utica provided installation or servicing instructions for the Boiler (which would seem likely), or if they were provided, whether the instructions called for use of screws, fasteners or another method of attaching the Connector to the Boiler.

A criminal investigation into Kit’s death was conducted by the NH State Fire Marshalls Office (the “NHSFMO”) and the county attorney’s office (the “CAO”) in the county where my mom lived. A civil lawsuit for wrongful death was also brought against the servicing company by my mom’s Estate. Both those legal matters are fully concluded at this time. **Exhibit 2** to this comment consists of a portion of the CAO’s official, written report on the facts surrounding my mom’s death,<sup>3</sup> and I would refer you to that exhibit for further background information about my mom’s heating system and the manner in which it failed. NFPA Section 211, as well as Section 31, have been adopted as law in New Hampshire with slight modifications that are not material

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<sup>3</sup> All exhibits to this comment are redacted such that the Company, and its employees and agents who were involved in this matter, are not identified.

to the issues discussed in this comment. The Event also caused approximately \$40,000 in real property damage and personal property loss at Kit's home.

## II. Purpose and Goal of this Comment

I am advocating that Section 211 be revised or clarified as follows: **In all instances** when an oil-fired device is annually or otherwise serviced, repaired or maintained, Section 211 should expressly, unequivocally and unambiguously require the use of screws, fasteners or some equivalent method or system (including a system provided or recommended by the manufacturer of the heating device) to secure the connector pipe to the flue collar on the device. Conversely, Section 211 should never permit, nor be construed to permit, that the connector pipe may be attached to the flue collar of an oil-fired device via use of a "friction-fit" or "force-fit" connection only.<sup>4</sup>

Based on my experience with the investigations into my mom's death, I believe that Section 211's provisions regarding the use of fasteners or another system for securely attaching the connector pipe to the flue collar on oil-fired devices are being inconsistently interpreted and applied by those involved in the oil-heating industry. Alternatively, I would submit that Section 211's provisions as currently written do not provide adequate protection against the substantial danger presented when a connector pipe becomes dislodged from an oil-fired device as a result of a delayed ignition event or for other reasons.<sup>5</sup>

## III. The Special Problems Faced When Servicing Older Oil-Fired Heating Devices

Since the manufacturer's manual for the Boiler was not available to the tech when the Boiler was serviced, including in the summer of 2015, the Company and service tech relied on Section 211 and/or the training provided by the NORA pursuant to Section 211 in deciding how to secure the Connector to the Boiler's collar. I suspect that there are hundreds of thousands or more, older, oil-fired heating devices still in service in this country. I further suspect that the manufacturer's instructions for a substantial number of those devices are not with the devices or otherwise available, including to techs servicing the devices per Section 211. Adding to the problem is the fact or likelihood that most older, oil-fired devices lack a manufactured system for attaching the connector pipe to the collar.

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<sup>4</sup> In fact, to the extent that gas-fired heating devices also experience low-level explosive events akin to a delayed-ignition event occurring with an oil-fired device, it may well be appropriate to also revise and clarify Section 211 with respect to the fastening of connector pipes to gas-fired heating devices.

<sup>5</sup> Clarifying or otherwise modifying the provisions of Section 211 in order to require a more secure connection of the connector pipe to the collar on an oil-fired (or gas-fired) device will also serve to protect against the pipe from becoming dislodged for reasons other than a delayed ignition event, such as the vibration of the heating-device during operation or because someone accidentally bumps into the pipe.

All of this places the servicing tech in a difficult situation in terms of deciding how to attach the connector pipe to the flue collar, and potentially leaves the occupants of the structure exposed to the dangers of the connector pipe becoming dislodged from the heating device. Section 211 should therefore provide a clear-cut, minimum or baseline standard for the method of attaching the connector pipe to the flue collar during maintenance activities, including in those instances where the manufacturer's instructions cannot be located, ascertained and followed at the time the oil-fired device is serviced.

I concede that the manufacturer's manual ought to be followed when servicing an oil-fired heating device per Section 211 in those instances where the manufacture's manual or instructions are available to the service-tech. See Section 211, Subpart 9.7.12 (2). But when the instructions are unavailable, and in all cases as a minimum or baseline, the standard set forth in Section 211, Subpart 9.7.9 requiring the use of screws, fasteners or *the equivalent* should apply to the attachment point where the connector pipe joins the collar.

#### IV. Purpose of Section 211; Protection Against Carbon Monoxide

Subpart 1.2 of Section 211 is entitled "Purpose" and provides that the "... primary purpose of this standard is the removal of waste gases ..." including from heating appliances serving residential structures. Carbon monoxide is recognized by Section 211 and other applicable NFPA codes as a killer. Delayed ignition events involving oil-fired heating are not uncommon and MUST ALWAYS be anticipated by those installing and servicing oil-fired heating devices. Preventing the release of CO and other toxic gases into a home (including as a result of a delayed ignition event) is the most important safety-related consideration faced by oil-heating installers and servicers. If a tech fails to consider, anticipate and take action to prevent CO-related releases, people can and will be seriously hurt or will die.

#### V. Provisions of Section 211 at Issue

The following language and provisions of Section 211 are applicable to this matter in my view: Subpart 9.2.2 provides that "[c]onnectors for residential-type [heating] appliances shall conform to the requirements of this chapter." Subpart 9.7.9 provides that "[c]onnectors shall be supported and joints fastened using sheet metal screws, rivets or other appropriate means." As best I can determine, the term "joints" is not defined in or by Section 211 or by another NFPA code including the General Provisions code at NFPA Section 1. Subparts 14.2, 14.2.1 and 14.3 of Section 211 collectively require that, on an annual basis, connector pipes and vents be inspected, cleaned and repaired as necessary. Critically, Subpart 14. 8 provides that "[w]hen inspection ... shows that an existing ... vent is damaged, unsuitable or improperly sized, it shall be repaired, rebuilt, or resized to the construction and functional requirements of this chapter".

Subpart 1.2.2 states that “[t]his standard [Section 211] provides minimum construction and installation requirements for chimneys and vents suitable for use with fuel-burning appliances”. Importantly, Subparts 1.4.1. and 1.4.2 effectively provide that methods that are equivalent (or superior) in terms of achieving the standards required by Section 211 are acceptable and are compliant with Section 211. Subpart 9.7.12 (2) provides that “[l]isted gas or oil appliances should be installed and serviced in accordance with the listing.”

One of my conclusions from reading the above provisions is as follows: When a component of the connector system is discovered to be “unsuitable” during inspection of heating device, including because the component is not compliant with the current version of Section 211, *then the tech performing the service MUST bring the component up to the code requirements existing at the time of servicing.* As such, Section 211 effectively requires (or should require) that an oil-service tech must comply with the then-current provisions of Section 211 *each and every* time the tech services an oil-fired system. That means or should mean that an oil-service tech must affix the connector pipe to the collar with screws or fasteners or by other equivalent means (including as directed by the manufacturer) in accordance with Subpart 9.7.9 every time service is performed on an oil-fired device. But in my mother’s case, this simply did not happen.

The following part of this comment discusses the evidence and other information discovered during the criminal and civil investigations into Kit’s death. In my view, the evidence described below demonstrates the disagreement within the oil-heating industry as to the proper and required methods for connecting the vent pipe to the flue collar on an oil-fired device. Alternatively and in my view, the evidence demonstrates that the existing language of Section 211 does not sufficiently address the manner of attaching the connector pipe to the flue collar and leaves people at risk of injury or death from the effects of CO.

#### VI. Evidence Supporting the Need to Revise Section 211

As noted, the Company did not dispute that screws or other fasteners were required by Section 211 to secure the vent pipe sections themselves together when maintenance activities are performed on an oil-fired device per Section 211.<sup>6</sup> Conversely, a significant dispute arose during both the criminal and civil investigations into Kit’s death whether or not Section 211 (and Section 31) *always* require that screws, fasteners or *the equivalent* be used to secure the vent pipe to the flue collar on an oil-fired device when the device is serviced. The Company argued that a “friction-fit” or “force-fit” of the vent pipe to the collar onto the Boiler was consistent with Section 211, and with industry standards and practices. Other participants in the investigation of mom’s death were adamant that screws, fasteners or the functional equivalent are *always*

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<sup>6</sup> The Company effectively conceded that Section 211 requires screws or equivalent fasteners be used to connect the pipe sections together by Section 211, and that they and their service-technician violated Section 211 by failing to use screws to hold the pipe together when servicing the Boiler.

required to be used per existing provisions of Sections 31 and 211 (including in existence as of 2016) when attaching the connector pipe to the flue collar.

**Exhibit 3** to this comment consists of part of the report of a defense expert involved in Kit's civil, wrongful death case who operates an oil-heating installation and servicing business in Massachusetts. He maintains that a "force-fit" (i.e. friction-fit) of a vent pipe to the flue collar of an oil-fired device including my mom's Boiler "... was in conformance with oil industry standards ... and practices" including with NFPA Section 211 and Section 31.<sup>7</sup> **Exhibit 4** is the report from another defense expert for the Company who is a NORA instructor at a trade school in New Hampshire, and who trains and certifies oil-service technicians. His report provides that "[i]n New Hampshire it is standard industry practice to use a friction fit connection between the sheet metal flue vent pipe and the boiler's cast iron flue collar ..." and that fastening the connector pipe to the collar via a friction fit is consistent with NFPA Section 31 (and by implication Section 211) and the NORA training materials he uses to teach oil-service tech pupils in NH. See **Exhibit 4**. The NORA instructor goes on to state that "[i]n over forty years and thousands of service calls and installations of cast iron oil fired boilers *I have never encountered a situation* where the sheet metal flue pipe was installed using anything other than a 'force fit' [i.e. a "friction-fit"] to the cast iron flue connector [i.e. flue collar]." See **Exhibit 4**. (emphasis supplied by me). The NORA instructor further states that NORA's training materials and curriculum provide only that the vent pipe "... should be tightly fitted to the breeching [i.e. the flue collar] ..." via a friction-fit or force-fit and that no other means of preventing the vent pipe from dislodging from the flue collar is required or is even a best practice! See **Exhibit 4**.

The disagreement over, or the insufficiency of, the requirements set forth in Section 211 regarding attaching the connector pipe to the flue collar on oil-fired device is also evidenced by the following:

1. The Company's service tech who worked on mom's Boiler for 6 years prior to the Event testified in the civil lawsuit that he was not required to use screws or other fasteners at the flue collar on the Boiler, and that "simply using" a friction fit of the Connector to the flue collar was acceptable and/or permitted. See portions of the service tech's deposition transcript from the civil lawsuit attached as **Exhibit 5**;

2. The service tech's supervisor at the Company likewise testified at his deposition in the civil case that use of a friction fit to join the connector pipe to the flue collar was proper and acceptable. In fact, he expressly testified that "[m]ost [boilers] are not designed to ..." have the connector pipe are not designed to be hooked [i.e. fastened to the flue collar]. They're friction fit." See excerpt from the supervisor's deposition in the civil case attached as **Exhibit 6**;

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<sup>7</sup> Again, a "force-fit" or "friction-fit" simply involves shoving or placing the end of the connector pipe onto the flue collar without using any type of fastening system to attach the pipe to the collar.

3. Following my mom's death, the Company made no changes in or to its practices with respect to connecting the vent pipe to flue collars on oil-fired devices that they service. *In other words, the Company and its service-techs apparently continue to use friction fits to this very day as the only means of attaching the connector pipe to the flue collar when they service oil-fired devices.* See **Exhibit 6** at page 64, and a portion of the answers to interrogatories provided by the Company in the civil case attached as **Exhibit 7**;

4. The CAO declined to bring criminal charges for my mom's death based, in part, on that office's conclusion that the provisions of Section 31 and Section 211 relating to attaching the vent or connector pipe to the flue collar on an oil-fired device were ambiguous or substantially in dispute by those investigating my mom's death, and more generally by those involved in the oil-heating industry.<sup>8</sup> See **Exhibit 8** consisting of a portion of the CAO's report into the criminal investigation of my mom's death at pages 22-25;

5. The NHSFMO did not issue a citation to the Company or its service-technician for failing to use screws or another fastening system to attach the Connector pipe to the collar on the Boiler. See **Exhibit 8** at pages 24-25; and

6. The NORA Oil Heat Technician's Manual (Silver version) (the "Manual") regarding certification and training of oil-service techs does not expressly reference the use of screws or fasteners at the flue collar. It therefore seems possible that NORA does not intend that its training materials or curriculum mandate the use of screws or an equivalent fastening method at the flue collar, though that is unclear and seemingly in dispute including as described in this comment. See a portion of the Manual attached as **Exhibit 9** at pages 6-9 and 6-10. At the same time, NORA recognizes and warns against the dangers of CO in the Manual. In fact, the Manual provides expressly that a "loose or disconnected chimney or vent connections" can be the source of CO release into a structure, and that an oil-service tech must always look for evidence of such when performing maintenance on oil-fired devices. See **Exhibit 9** at pages 7-7 and 7-8.

On the other hand, a forensic investigative expert retained by my mom's Estate in the civil case involving her death believes that screws, fasteners or the equivalent are required by Sections 31 and 211 at the vent pipe/flue collar connection in all instances and at all times. See excerpt of report of John Certuse at **Exhibit 10**, as well as the accompanying letter of Mr. Certuse submitted with his comment. Similarly, the oil-heat expert retained to aid in the CAO's criminal investigation into my mother's death was adamant that screws, fasteners or the functional equivalent were always required by NFPA codes in order to join the connector pipe to the flue

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<sup>8</sup>I am not advocating that anyone should have been criminally charged for my mother's death, but rather want to bring attention to the CAO's opinion as stated in his investigative report concerning the potential or actual ambiguity or insufficiency of the NFPA code provisions at issue in my mom's case.

collar on an oil-fired heating device. See the report from the county's consultant attached as **Exhibit 11, Exhibit 7** at pages 22-23, and the accompanying letter from John A. Bell, former assistant county attorney, dated May 24, 2021. See also other letters from third parties submitted in support of the revisions requested in this comment and published by NFPA.

Finally, attached as **Exhibit 12** is a report with photos from Peter Ripaldi of Ripaldi Home Inspections in Hudson NH. Pete has been my friend for 20+ years and I asked him to comment on his experience inspecting homes with oil-fired heating devices. Per the letter from Mr. Ripaldi, *up to a third of the oil-fired boilers he currently inspects* as part of the home inspections he performs in New Hampshire use a friction-fit only to "attach" the connector pipe to the flue collar. This includes devices which have been recently serviced! Pete's report shows that this problem is widespread to the point of being epidemic. Each and every one of the occupants in the homes without an adequate fastening system to hold the connector pipe to the flue collar on the oil-fired heating devices that Mr. Ripaldi inspects are in imminent danger of serious injury or death in the event the connector pipe becomes dislodged from the flue collar while the device is operating.

## VII. Conclusion; Potential and Proposed Solutions

No one else should lose their life like my mom did, including for the lack of 3 sheet metal screws or a couple of pieces of metal strapping to hold a connector pipe onto the flue collar of any heating device, including an oil-fired heating device. Section 211 should therefore be revised to unambiguously require that screws, fasteners *or the functional equivalent* (including as directed by a manufacturer of the heating device) are ***always*** required to be used to attach the connector pipe to the flue collar on an oil-fired device (or on both gas- and oil-fired devices). Conversely, Section 211 should ***never permit, nor be construed to permit***, the use of a friction-fit or force-fit only to attach the connector pipe to the flue collar, including to the flue collar on an oil-fired device.

NFPA, NORA and the rest of the oil-heating industry need to come to terms with the fact that there is a gap in the safety net otherwise provided to those who heat their homes and household water with oil. Preserving the integrity of the connector pipe is paramount when it comes to protecting people from the dangers of CO. Taking care to screw the sections of pipe together and cementing one end of the pipe into the chimney is not enough when the other end of the connector pipe is simply placed onto the flue collar and can therefore become easily dislodged as was the case with Kit's boiler. The connector pipe system is only as strong as its weakest link. I would submit to you that the link at the flue collar is very weak indeed given the prevalence of use of "friction-fits" in New Hampshire and likely across the country.

I suppose there at least a couple ways of revising Section 211 as follows:

A. Adding a Definition for the term "Joint" – One possibility would be to define the term

“joint” as used in Section 211. However, defining the term “joint” might or would impact other NFPA codes. In addition and in my view, as soon as one defines a term, the scope of the term tends to get narrowed. If however the term “joint” was to be defined for these purposes, the definition might be limited to defining the use of that term in Section 211 only. For example, Subpart 9.7.9 could be revised by adding the highlighted language below to the existing language of Subpart 9.7.9 such that the revised version of Subpart 9.7.9 would read as follows: “Connectors shall be supported and joints fastened using sheet metal screws, rivets, or other approved means. **For purposes of Section 211 only, the term ‘joint’ shall include, but shall not be limited to, the attachment point where the connector is joined to the flue collar on an oil-fired heating device.**”

B. Revising Subpart 9.7.12 (2) of Section 211 - I personally think a better approach, however, would be to revise Section 211, Subpart 9.7.12 (2), which addresses the manufacturer’s instructions for attaching connector pipes to the flue collar. For example, one could revise that section by adding the highlighted language shown below so that the revised version of Subpart 9.7.12 (2) would read as follows: “Listed gas or oil appliances should be installed and serviced in accordance with the listing; **provided that, in all instances, the method for attaching the connector to the flue collar on an oil-fired heating device shall provide equivalent or superior protection against the connector becoming dislodged from the flue collar as is provided by the standard set forth in Section 211, Subpart 9.7.9.**” This revision avoids tinkering with the definition of “joint,” and conforms with the general notion of equivalency set forth in Section 211, Subparts 1.4.1. and 1.4.2 as well as the “minimum standard” language set forth in Subpart 1.2.2. This revision would also assist in assuring that the then-current standards set forth in the NFPA codes (including Section 211) will be applied and followed during annual or other maintenance activities undertaken pursuant to Subpart 14 of Section 211, including to all such activities undertaken in the future. Most importantly perhaps, revising Subpart 9.7.12 (2) in this way will preserve the manner of attaching the connector pipe to the flue collar on an oil-fired device as instructed by the heating appliance manufacturer - *so long as that method of attachment meets a minimum standard of safety*. This is especially important with respect to older oil-fired devices where the manufacturer’s instructions are not available, or in cases where the manufacturer’s recommended method of attaching the connector to the collar on an older, oil-fired device is not consistent with the requirements of the then-current version of Section 211 and therefore is unsafe.

I look forward to working with the Committee on these issues. Thank you for your consideration.

Sincerely,

Gary A. Braun  
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(603) 321-1296  
garybraun82@outlook.com

Encls.



## Public Input No. 5-NFPA 211-2019 [ New Section after 15.1.2 ]

### TITLE OF NEW CONTENT

Type your content here ...

15.1.3\* Inspections required by this chapter shall be limited to appliances and systems regulated by this standard.

Add Annex A15.1.3 Inspections required by this chapter are not required to include inspection of appliances not covered by this standard. For example, when a gas or oil-fired furnace is connected to a masonry chimney the inspector is required to inspect the connector and chimney but not the appliance.

### Statement of Problem and Substantiation for Public Input

This clarifies that the inspection standard only applies to systems and appliances covered by NFPA 211.

### Submitter Information Verification

**Submitter Full Name:** James Brewer

**Organization:** ROOFTOP SAFETY USA LLC

**Affiliation:** National Chimney Sweep Guild

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Tue Dec 03 14:18:34 EST 2019

**Committee:** CHI-AAA

### Committee Statement

**Resolution:** Chapter 15 calls for inspection of appliance without reference to fuel source. Adding this requirement would cause confusion to users of the code as certain appliances are within the scope of NFPA 211 while other appliances are not.



## Public Input No. 6-NFPA 211-2019 [ New Section after 15.2.5 ]

### TITLE OF NEW CONTENT

Type your content here ...

15.2.6 Where inspections are indicated or requested at a specific level but circumstances prevent the completion of that level of inspection the inspector shall indicate the level of inspection completed. The inspector shall document the reasons the higher level inspection was not completed.

### Statement of Problem and Substantiation for Public Input

This section is proposed to clarify how to handle situations where a higher level of inspection is indicated but cannot be completed. For example, a Level 2 inspection is indicated but the roof or attic is not accessible.

### Submitter Information Verification

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**Submittal Date:** Tue Dec 03 14:22:28 EST 2019

**Committee:** CHI-AAA

### Committee Statement

**Resolution:** [FR-11-NFPA 211-2021](#)

**Statement:** This section is proposed to clarify how to handle situations where a higher level of inspection is indicated but cannot be completed. For example, a Level 2 inspection is indicated but the roof or attic is not accessible.



## Public Input No. 7-NFPA 211-2019 [ Section No. 15.3.2 [Excluding any Sub-Sections] ]

Level I inspections shall include examination of readily accessible portions of the chimney and accessible portions of the connected appliance and chimney connection. There is no requirement to enter attics, basements, or crawlspaces during a Level I inspection. These areas are specifically addressed under Level II inspections.

### Statement of Problem and Substantiation for Public Input

This change is recommended to clarify that attics, basements & crawlspaces are not a required part of Level 1 inspections. When the standard was written there was never any intent for these areas to be included in a Level 1 inspection but some people have opined that they were a required part of the inspection in some circumstances.

### Submitter Information Verification

**Submitter Full Name:** James Brewer  
**Organization:** ROOFTOP SAFETY USA LLC  
**Affiliation:** National Chimney Sweep Guild  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Dec 03 14:30:27 EST 2019  
**Committee:** CHI-AAA

### Committee Statement

**Resolution:** Going into attics, basements, and crawlspaces is sometimes readily accessible and a necessary part of a Level 1 inspection.



## Public Input No. 9-NFPA 211-2019 [ New Section after 15.4.2.3 ]

### TITLE OF NEW CONTENT

Type your content here ...

Add Exception: The requirement to inspect “all chimney flues” and “all flue liners” is limited to the chimney flues and flue liners under the control of the inspector’s client. Where multiple factory built fireplaces and/or chimneys are installed in a common structure or chase there is no requirement to inspect more than the system(s) requested to be inspected by the inspector’s client.

### Statement of Problem and Substantiation for Public Input

This proposed exception clarifies that inspections are limited to the systems under the control of the client. In older areas there are many homes built with “common wall (masonry) chimneys” that contain flues serving different occupancies and it is impractical to require inspection of those other systems. This also clarifies that where multiple factory-built systems exist within a common chase there is no requirement to inspect all systems in the chase. This is a common problem in apartments and condos.

### Submitter Information Verification

**Submitter Full Name:** James Brewer

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**Affiliation:** National Chimney Sweep Guild

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**Zip:**

**Submittal Date:** Tue Dec 03 14:39:50 EST 2019

**Committee:** CHI-AAA

### Committee Statement

**Resolution:** FR-17-NFPA 211-2021

**Statement:** This requirements clarifies that inspections are limited to the systems requested by the client. In older areas there are many homes built with “common wall (masonry) chimneys” that contain flues serving different occupancies and it is impractical to require inspection of those other systems. This also clarifies that where multiple factory-built systems exist within a common chase there is no requirement to inspect all systems in the chase. This is a common problem in apartments and condos.



## Public Input No. 8-NFPA 211-2019 [ Section No. 15.4.2.3 ]

### 15.4.2.3

The inspection shall include examination of accessible areas of all chimney flues and the internal surfaces of all flue liners incorporated within the chimney with video scanning equipment or ~~other means~~ more advanced technological viewing systems used as necessary to observe those areas.

## Statement of Problem and Substantiation for Public Input

The purpose of this recommended change is to insure the internal flue is inspected by video scanning or other means equal or better than video scanning. When the standard was originally drafted the “other means” was put there to allow future innovation. However, the words “other means” have sometimes been interpreted to be a flashlight or mirror and this was never the intent of the original standard.

## Submitter Information Verification

**Submitter Full Name:** James Brewer  
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**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Dec 03 14:34:20 EST 2019  
**Committee:** CHI-AAA

## Committee Statement

**Resolution:** FR-12-NFPA 211-2021

**Statement:** The purpose of this recommended change is to insure the internal flue is inspected by image scanning or other means equal or better than image scanning. When the standard was originally drafted the “other means” was put there to allow future innovation. However, the words “other means” have sometimes been interpreted to be a flashlight or mirror and this was never the intent of the original standard.



## Public Input No. 1-NFPA 211-2019 [ Section No. A.15.1.1 ]

### A.15.1.1

Certain minor ~~tasks, such as installation of a chimney cap or flashing repair, are~~ tasks are so limited in scope that they do not trigger a full inspection of the chimney. However, any defects or potential hazards encountered during such work should not be ignored and should be brought to the attention of the responsible party.

### Statement of Problem and Substantiation for Public Input

Installing a cap not listed with a factory built fireplace, chimney, or lining system could void the listings of such systems. An inspection would be necessary on these systems to determine the proper cap. Same with flashing on factory built chimneys.

### Submitter Information Verification

**Submitter Full Name:** Lou Curley

**Organization:** Lou Curley's Chimney Service

**Street Address:**

**City:**

**State:**

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**Submittal Date:** Mon Mar 04 16:32:06 EST 2019

**Committee:** CHI-AAA

### Committee Statement

**Resolution:** The annex material is unenforceable language and only provides explanatory information as to certain tasks that might not require full chimney inspection.



## Public Input No. 23-NFPA 211-2021 [ Section No. B.1.2.5 ]

### B.1.2.5 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 103, *Standard for Factory-Built Chimneys for Residential Type and Building Heating Appliances*, 2010, revised 2012 2016 .

UL 907, *Fireplace Accessories*, 2016, revised 2019 .

UL 1738, *Standard for Venting Systems for Gas-Burning Appliances, Categories II, III and IV*, 2010, revised 2014 2021 .

UL 2034, *Standard for Single and Multiple Station Carbon Monoxide Alarms*, 2008, revised 2016 2018 .

## Statement of Problem and Substantiation for Public Input

Referenced standards are updated to reflect most recent publication date.

## Related Public Inputs for This Document

| <u>Related Input</u>                                  | <u>Relationship</u> |
|-------------------------------------------------------|---------------------|
| Public Input No. 11-NFPA 211-2019 [Global Input]      |                     |
| Public Input No. 22-NFPA 211-2021 [Section No. 2.3.3] |                     |

## Submitter Information Verification

**Submitter Full Name:** Kelly Nicolello

**Organization:** UL LLC

**Street Address:**

**City:**

**State:**

**Zip:**

**Submission Date:** Tue Jun 01 12:20:50 EDT 2021

**Committee:** CHI-AAA

## Committee Statement

**Resolution:** FR-5-NFPA 211-2021

**Statement:** UL Standards are largely ANSI approved and having the designation ANSI can confuse the user of the standard into thinking ANSI is the reviser of the standard and not UL.