AGENDA

Meeting of January 14, 2014
San Antonio, TX

The National Board of Boiler & Pressure Vessel Inspectors
1055 Crupper Avenue
Columbus, Ohio 43229-1183
Phone: (614)888-8320
FAX: (614)847-1828
1. Call to Order – 1:00 P.M.

2. Announcements

3. Adoption of the Agenda

4. Approval of Minutes of July 16, 2013

5. Review of the Roster (Attachment 1)
   
   - Mr. Ray Snyder has retired from his position at Arise therefore resigning his position on all committee work. A majority vote will be taken in the SC meeting for a new Vice Chairman for SG on Pressure Vessel and Piping.

6. Action Items (Attachment 2)

   **NB10-0201 - Part 1 S3, SG Pressure Vessels and Piping** - Expand the section on installation of thermal fluid heaters. This action item is a result of splitting NB09-0601 into two parts. A task group of D. Patten (Project Manager), G. Halley, M. Wadkinson, and P. Bourgeois has been assigned. (Attachment 2, pp. 2-12)

   January 2010
   A progress report was given.

   July 2010
   A progress report was given by Mr. Gary Scribner.

   January 2011
   A progress report was given by Mr. Scribner.

   July 2011
   A progress report was presented. Correction was made to the task group as listed to removing G. Scribner as Project Manager and listing D. Patten as Project Manager and M. Wadkinson.

   January 2012
   Don Patten reported that there was no progress at this time.

   July 2012
   Mr. Patten and Ms. Wadkinson presented a progress report. This continues to be a work in progress. Mr. Patten will put together an update and send it to Mr. Scribner who will in-turn get this out to the SG and if need be a letter ballot.

   January 2013
   Mr. Patten and Ms. Wadkinson presented a handout of proposed text for Part 1, Section 6 – Supplements. The committee reviewed and shared their feedback to include editorial additions, deletions, rewording and safety concerns. The TG will revise the document and will send out as letter ballot before the next meeting.
July 2013
M. Wadkinson presented a proposal addressing the Installation of Thermal Fluid Heaters, which incorporated editorial additions, deletions, rewording and safety concerns proposed from the January 2013 meeting. This SG reviewed and suggested additional changes to complete a final draft proposal. A motion was made to incorporate all and any additional editorial changes into a final draft proposal to be presented to the SC. The motion was approved – 7, and not voting – 1.

January 2014
Ms. Wadkinson is expected to report.

NB12-0302 - Part 1, SG V&P Define installation requirements for (PVHO) hyperbaric chambers) this action item is a result of splitting NB09-0601into two parts. A task group of G. Scribner (Project Manager), B. Moore, and M. Richards have been assigned. (No attachment)

January 2012
Mr. Scribner presented a progress report.

July 2012
Mr. Scribner presented a progress report. Concentration will be aimed in defining types and then Identifying installation requirements.

January 2013
Mr. Scribner presented a progress report. Part 2 has been and continues working on this with several conversations having taken place. ASME standards have revealed a number of additional needs in specific areas such as, single chamber, multi-chamber, animals, etc. In addition, there is a belief that there should be a specific endorsement for an individual to sign off on these devices. This is being further investigated with NBIC. The direction is to define the different types of PVHO’s by letter ballot before the next meeting. The TG will work with PVHO to come up with definitions. Mr. Brian Moore has been added to the TG.

July 2013
G. Scribner presented no new progress at this time. Ongoing conversations and follow-up with Part 2 continues and should have an update/proposal by the January 2014 meeting.

January 2014
Mr. Moore is expected to report.

NB13-0102 - Part 1, S3.6 SG PVP This action item is a result of public review comment PR13-0602. Address through wall CO₂ piping. A TG of G. Scribner (Project Manager) and P. Bourgeois was assigned. (Attachment 2, pp. 13-16)

July 2013
G. Scribner presented a progress report. A TG of G. Scribner (Project Manager) and P. Bourgeois were assigned.

January 2014
Mr. Bourgeois is expected to report.

7. New Business

8. Future Meetings

July 15-18, 2014 Columbus, Ohio
January 19-22 Orlando, FL
9. Adjournment

Respectfully Submitted,

Jeanne Bock
Secretary
### NBIC Subgroup Installation (Pressure Vessels and Piping)

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**Total Members:** 7
National Board Inspection Code
Subcommittee Installation
Subgroup on Pressure Vessels and Piping

Members:

Donald Patten
Stan Konopacki
Gary Scribner
Melissa Wadkinson

Task Group Assignment

Address Thermal Fluid Heater Installation

Source

PR 07 – 2102

Proposal

Insert the following text as Part 1, Section 6 Installation – Supplements

________________________________________________________________________

Proposed Text

PART 1, SECTION 6
SUPPLEMENT 4
INSTALLATION OF THERMAL FLUID HEATERS

S4.1 SCOPE

This Supplement describes guidelines for the installation of a Thermal Fluid Heater. A Thermal Fluid Heater System consists of the Heater, Expansion Tank, Circulating Pump, safe catchment with the proper Piping and Controls to heat jacketed kettles, presses, reactors, ovens, exchangers, etc.

S4.2 DEFINITION

A thermal fluid heater is a closed loop liquid phase heater (flooded pressure vessel) in which the heat transfer media is heated but no vaporization takes place within the vessel. Depending on the fluid selection and operating parameters, systems may be open or closed to the atmosphere. Closed systems may be pressurized with an inert gas blanket.

A thermal fluid vaporizer is a heater in which the thermal fluid is vaporized within the pressure vessel.
Thermal fluid: a fluid (other than water) that is chemically stable over a large temperature range and is specifically designed for use as a heat transfer medium.

**S4.3 General Requirements**

**S4.3.1 Supports, Foundations, and Settings**

Each thermal fluid heater and its associated piping must be safely supported. Design of supports, foundations, and settings shall consider vibration (including seismic where necessary), movement (including thermal movement), and loadings (including the weight of the fluid in the system) in accordance with jurisdictional requirements, manufacturer’s recommendations, and/or other industry standards, as applicable.

**S4.3.2 STRUCTURAL STEEL**

a) If the thermal fluid heater is supported by structural steel work, the steel supporting members shall be so located or insulated that the heat from the furnace will not affect their strength.

b) Structural steel shall be installed in accordance with jurisdictional requirements, manufacturer’s recommendations, and/or other industry standards, as applicable.

**S4.3.3 SETTINGS**

The thermal fluid heater shall be installed on a flat, level, hard, non-combustible surface preferably of concrete to protect against any fire hazard. A 4” containment curb or 2” seal welded drip lip around the thermal fluid heater equipment skid shall be provided.

**S4.3.4 CLEARANCES**

a) Thermal fluid heater installations shall allow for normal operation, maintenance, and inspections. There shall be at least 18 in. (457 mm) of clearance on each side of the thermal fluid heater to enable access for maintenance and/or inspection activities. Thermal fluid heaters operated in battery shall not be installed closer than 18 in. (457 mm) from each other. The front or rear of any thermal fluid heater shall not be located nearer than 36 in. (915 mm) from any wall or structure.

b) Vertical heaters shall have at least 60 in. (915 mm) clearance from the top of the heater or as recommended by the heater manufacturer.

c) Heaters with a bottom opening used for inspection or maintenance shall have at least 12 in. (350 mm) of unobstructed clearance.

d) **NOTE:** Alternative clearances in accordance with the manufacturer’s recommendation are subject to acceptance by the Jurisdiction.

**S.4.4 THERMAL FLUID HEATER ROOM REQUIREMENTS**

**S.4.4.1 EXIT**
Two means of exit shall be provided for thermal fluid heater rooms exceeding 500 sq. ft. (46.5 sq. m) floor area and containing one or more thermal fluid heaters having a combined fuel capacity of 1,000,000 Btu/hr (293 kW) or more. Each elevation shall be provided with at least two means of exit, each to be remotely located from the other. A platform at the top of a single thermal fluid heater is not considered an elevation.

S4.4.2 LADDERs AND RUNWAYS

a) All walkways, runways and platforms should be:

1) Of metal construction

2) Provided between or over the top of heaters that are more than 8 ft. (2.4 m) above the operating floor to afford accessibility for normal operation, maintenance, and inspection;

3) Constructed of safety treads, standard grating, or similar material and have a minimum width of 30 in. (760 mm);

4) of bolted, welded, or riveted construction;

5) Equipped with handrails 42 in. (1070 mm) high with an intermediate rail and 4 in. (100 mm) toe-board.

b) Stairways that serve as a means of access to walkways, runways, or platforms shall not exceed an angle of 45 degrees from the horizontal and be equipped with handrails 42 in. (1070 mm) high with an intermediate rail.

c) Ladders that serve as a means of access to walkways, runways, or platforms shall:

1) Be of metal construction and not less than 18 in. (460 mm) wide;

2) Have rungs that extend through the side members and are permanently secured;

3) Have a clearance of not less than 30 in. (760 mm) from the front of rungs to the nearest permanent object on the climbing side of the ladder;

4) Have a clearance of not less than 6-1/2 in. (165 mm) from the back of rungs to the nearest permanent object;

5) Have a clearance width of at least 15 in. (380 mm) from the center of the ladder on either side across the front of the ladder.

d) There shall be at least two permanently installed means of exit from walkways, runways, or platforms that exceed 6 ft. (1.8 m) in length.

S4.5 SYSTEM REQUIREMENTS

S4.5.1 THERMAL LIQUIDS (HEAT TRANSFER FLUIDS)
It is extremely important that the proper heat transfer fluid be selected by competent personnel knowledgeable of the system. Heat transfer fluids should meet the following basic requirements:

a) Resist deterioration at the temperatures involved, to assure long useful life and a clean system.

b) Possess good heat transfer characteristics.

c) Have low vapor pressures at operating temperatures to permit operation at moderate pressures. Note: processes requiring thermal fluid temperatures higher than 650°F will require the use of specialty fluids with high vapor pressures (e.g. 150 psi). These fluids also tend to have special environmental, safety and health considerations.

d) Have low viscosities to decrease pumping losses (due to pipe friction) and the power required for circulation.

e) Be suitable for outside temperatures involved to prevent freeze up unless a means of heat trace has been implemented.

f) Meet Environmental Regulations.

The heat transfer fluid must be kept clean and in proper condition. Tests of the fluid shall be conducted per the fluid manufacturer’s recommendations by approved laboratories. Any heat transfer fluid that is added must be clean and of the proper specification.

S4.5.2 EXPANSION

The expansion tank shall have sufficient volume to handle the required expansion of the total system thermal liquid at the required operating temperature.

The expansion tank should be sized so that when the thermal liquid in the system is cold, the tank will be one quarter full or as recommended by the manufacturer. When the system is up to operating temperature, the level of fluid in the expansion tank shall not exceed the manufacturer’s recommendation. A high expansion tank liquid level alarm may be used for indication of high liquid level in the expansion tank(s). An expansion tank low level switch (or similar device) shall be used to ensure the appropriate minimum level of fluid in the tank per the manufacturer’s recommendation. Tripping of this switch should shut down the pump and burner. The activation of this switch should activate an audible alarm and/or light. All expansion tank vents and drains shall be piped to a safe catchment or per the manufacturer’s recommendations.

If the expansion tank is to be pressurized with an inert gas, a safety relief valve shall be installed on the expansion tank. This safety relief valve shall be piped to a safe catchment.

S4.5.3 CONNECTION

The circulating pump shall be piped to the thermal fluid heater per the manufacturer’s recommendations.

The expansion tank should be installed at an elevation above all piping when possible. If the tank is not at the highest elevation, an inert gas blanket shall be used to pressurize the system to overcome the weight of the fluid above the tank.
S4.5.4 CIRCULATING PUMP

It is essential that the pump selection be made by competent personnel that are knowledgeable to the requirements of the specific system. Special attention to hot and cold alignment requirements and pump cooling requirements must be considered. The circulating pump must provide:

a) The required fluid flow across the heater tube surface.

b) Handle the Total System Head.

c) Be specifically designed to handle the thermal fluid at the high temperatures as well as the viscosity requirements of cold start conditions. The pump should be rated for the maximum operating temperature of the fluid.

A strainer should be located in each pump suction piping.

Globe valves or other throttling valves should be considered in the pump discharge piping to throttle the pump if necessary to prevent it from running out on its curve.

Dual pumps are often installed to provide 100% redundancy in the case of a pump failure. A flexible connection in and out of each pump is recommended.

S4.5.5 PIPING AND VALVES

Carbon Steel Pipe such as SA-53 or SA-106 is preferred for the entire piping system. Seamless pipe should be used for thermal fluid piping. Copper, copper alloys, brass, bronze, aluminum or cast iron should not be used as they are incompatible with most thermal fluids. All joints and connections Nominal Pipe Size (NPS) 1” (25 mm) and over (within the flow circuit) should be welded or flanged. All flange gaskets shall be suitable for the operating temperature, pressure and fluid used. Special attention shall be given to the expansion of the piping due to the high temperatures involved.

Valves shall be of steel material compatible for the thermal fluid and temperatures and shall be flanged or weld type manufactured from cast or forged steel or ductile iron. Valve internals and gland seals shall be made from materials suitable for use with high temperature fluids and compatible with the specific fluid utilized in the system.
When 2-way valves are utilized in the piping system, a back pressure regulating valve or automatic bypass valve shall be incorporated to ensure the proper flow through the heater at all times regardless of control valve position. If 3-way valves are used, balancing valves should be included.

Design of piping supports should be in accordance with jurisdictional requirements, manufacturer’s recommendations and/or other industry standards as applicable.

Thermal insulation used on the pipes and equipment should be selected for the intended purpose and for compatibility with the fluid. Where there is the potential for fluid system leaks (flanged joints etc.), the thermal insulation selected should be non-absorbent. Laminated foam glass or cellular glass (non-absorbent) insulation are examples of suitable insulation.

**S4.5.6 FUEL**

Fuel systems, whether firing on oil, gas or other substances, shall be installed in accordance with jurisdictional and environmental requirements, manufacturer’s recommendations, and/or other industry standards, as applicable.

**4.5.7 ELECTRICAL**

a) All wiring for controls, heat generating apparatus, and other appurtenances necessary for the operation of the thermal fluid heater(s) should be installed in accordance with the provisions of national or international standards and comply with the applicable local electrical codes.

b) A manually operated remote shutdown switch or circuit breaker shall be located just outside the equipment room door and marked for easy identification. Consideration should also be given to the type and location of the switch to safeguard against tampering.

c) A disconnecting means capable of being locked in the open position shall be installed at an accessible location at the heater so that the heater can be disconnected from all sources of potential. This disconnecting means shall be an integral part of the heater or adjacent to it.

d) If the equipment room door is on the building exterior, the shutdown switch shall be located just inside the door. If there is more than one door to the equipment room, there shall be a shutdown switch located at each door of egress. For atmospheric-gas burners, and oil burners where a fan is on a common shaft with the oil pump, the complete burner and controls should be shut off. For power burners with detached auxiliaries, only the fuel input supply to the firebox need be shut off.

e) Controls for Heat Generating Apparatus

1) Oil and gas-fired and electrically heated thermal fluid heaters shall be equipped with suitable primary (flame safeguard) safety controls, safety limit switches and controls, and burners or electric elements by a nationally or internationally recognized standard.

2) The symbol of the certifying organization that has investigated such equipment as having complied with a nationally recognized standard shall be affixed to the equipment and shall be considered as evidence that the unit was manufactured in accordance with that standard. Thermal fluid heater shall have:

   a. Expansion tank low level switch- liquid level switch (or similar device) interlocked with the circulating pump operation to confirm minimum level in the expansion tank when
the system is cold. This interlock prevents pump cavitation. The function of this device shall prevent burner and pump operation if the liquid level is not adequate.

b. Thermal fluid temperature operation control. This temperature actuated control shall shut down the fuel supply when the system reaches a preset operation temperature. This requirement does not preclude the use of additional operation control devices when required.

c. High temperature limit safety switch on the located on the thermal fluid heater outlet. This limit shall prevent the fluid temperature from exceeding the maximum allowable temperature of the specific fluid. The high temperature limit safety switch set point should be set no higher than the maximum temperature specified by the fluid manufacturer, heater designer or downstream process limits, whichever is lowest. Functioning of this control shall cause a safety shutdown and lockout. The manual rest may be incorporated in the temperature limit control. Where a reset device is separate from the temperature limit control, a means shall be provided to indicate actuation of the temperature sensing element. Each limit and operating control shall have its own sensing element and operating switch.

d. Primary flame safety control for each main burner assembly. This control shall de-energize the main fuel shut off valve and shut off pilot fuel upon loss of flame at the point of supervision. The function of this control shall cause a safety shutdown and lockout.

e. Power burners and mechanical draft atmospheric burners shall provide for the pre-ignition purging of the combustion chamber and flue passes. The purge shall provide no fewer than four air changes or greater as specified by the manufacturer.

f. Proof of flow interlock- thermal fluid heaters require a minimum flow rate to ensure proper velocities and film temperatures through the heater. A low flow condition can cause overheating, degradation of the fluid or heater coil or tube failure. Activation of this interlock shall cause a safety shutdown of the burner and pump. One or more interlocks shall be provided to prove minimum flow through the heater at all operating conditions.

3) In accordance with jurisdictional and environmental requirements, manufacturer’s recommendations, and/or other industry standards, as applicable, Thermal fluid heaters may also have:

a. A high stack temperature switch interlock – in the event of a high stack temperature (indication of improper combustion or cracked coil) this device shall shut off the burner and circulating pump and cause a lockout condition.

b. An inert gas smothering system (steam or CO2) – this system is used to quench combustion in the event of a cracked heater coil or tube. The gas smothering system should be installed per local codes and requirements. A typical system may include two stack limit switches, an alarm and valve to allow inert gas to enter the combustion chamber. One stack limit is set at a value above the typical stack temperature for the equipment (1000 deg. F) and the second is set at 100 deg. F above the first. If the limit is
tripped, the pump and burner will shut down. If the second limit is tripped, the inert gas shall enter the combustion chamber to quench the flame.

c. A high inlet pressure switch – this normally closed switch senses pressure at the heater inlet and its setpoint is determined based on the system design pressure when the system is cold. Activation of this switch indicates a restriction in flow and should shutdown the burner and pump and cause a lockout condition.

d. A low inlet pressure switch – this normally open switch senses pressure at the heater inlet and its setpoint is determined based on system pressure when the system is operating at temperature. Activation of this switch indicates a restriction in flow and should shutdown the burner and pump and cause a lockout condition.

e. A high outlet pressure switch – this normally closed switch senses pressure at the heater outlet and its setpoint is determined based on the system pressures when the system is at operating temperature. Activation of this switch indicates a restriction in flow and should shutdown the burner and pump and cause a lockout condition. Note: the setpoint of this switch should be lower than the safety relief valve setting.

4) These devices shall be installed in accordance with jurisdictional and environmental requirements, manufacturer’s recommendations, and/or industry standards, as applicable.

S4.5.8 VENTILATION AND COMBUSTION AIR

a) The equipment room shall have an adequate air supply to permit clean, safe combustion, minimize soot formation, and maintain a minimum of 19.5% oxygen in the air of the equipment room and sufficient to maintain ambient temperatures as recommended by the heater manufacturer. The combustion and ventilation air should be supplied by either an unobstructed air opening or by power ventilation or fans.¹

b) Unobstructed air openings shall be sized on the basis of 1 sq. in. (650 sq. mm) free area per 2000 Btu/hr (586 W) maximum fuel input of the combined burners located in the equipment room, or as specified in the National Fire Protection Association (NFPA) standards for oil and gas burning installations for the particular job conditions. The heater equipment room air supply openings shall be kept clear at all times.

c) Power ventilators or fans shall be sized on the basis of 0.2 cfm (0.0057 cu meters per minute) for each 1000 Btu/hr (293 W) of maximum fuel input for the combined burners of all thermal fluid heaters located in the equipment room. Additional capacity may be required for any other fuel burning equipment in the equipment room. Pressure in the room should be consistently neutral.

d) When power ventilators or fans are used to supply combustion air they shall be installed with interlock devices so that the burners will not operate without an adequate number of ventilators/fans in operation.

e) The size of openings specified in (b) may be reduced when special engineered air supply systems approved by the Jurisdiction are used.

f) Care should be taken to ensure that thermal fluid lines are not routed across combustion air openings, where freezing may occur in cold climates.

¹ Fans – When combustion air is supplied to the thermal fluid heater by an independent duct, with or without the employment of power ventilators or fans, the duct shall be sized and installed in accordance with the manufacturer’s recommendations. However, ventilation for the equipment room must still be considered.
S4.5.9 LIGHTING

The equipment room should be well lighted and it should have an emergency light source for use in case of power failure.

S4.5.10 EMERGENCY VALVES AND CONTROLS

All emergency shut-off valves and controls shall be accessible from a floor, platform, walkway, or runway. Accessibility shall mean within a 6 ft. (1.8 m) elevation of the standing space and not more than 12 in. (305 mm) horizontally from the standing space edge.

S4.6 DISCHARGE REQUIREMENTS

S4.6.1 CHIMNEY OR STACK

Chimneys or stacks shall be installed in accordance with jurisdictional and environmental requirements, manufacturer’s recommendations, and/or industry standards, as applicable.

S4.6.2 DRAINS

A suitable low point drain fitted with a stop valve shall be provided in the heater or connecting piping to allow the heat transfer media to be drained out of the pressure vessel and/or piping when necessary. The valve may either be locked in the closed position or a blank flange can be installed downstream of the valve. The valve should never be opened when there is temperature on the system.

S4.6.3 AIR VENT

A manual air vent valve should be installed on the high point of the system piping. This valve is typically used when filling or draining the system. The valve should never be opened when there is temperature on the system or when a pressurized system is utilized.

S4.7 PRESSURE RELIEF VALVES

4.7.1 GENERAL

The thermal fluid heater shall be provided with pressure relief valves appropriate for the code of construction of the heater and the intended service.

a) The pressure relief valve(s) shall be of a totally enclosed type designed for liquid service or vapor service as applicable to the application.

b) The pressure relief valve(s) shall be installed with a discharge piping directing any fluid to a safe point of discharge (safe catchment).

c) The pressure setting shall be not higher than the MAWP stamped on the completed heater.

d) The pressure relief valve shall not have a lifting lever.

e) Valve body drains are not required.

f) The inlet connection to the valve shall be not less than NPS ½ (DN 15).

g) The discharge connection of the pressure relief valve shall be at least one NPS pipe size larger than the inlet.

4.7.2 NUMBER

At least one device shall be provided for the protection of a heater.
4.7.3 LOCATION
a) Pressure relief devices shall be connected to the heater in accordance with the original code of construction.

4.7.4 CAPACITY
a) The pressure relief device(s) shall have sufficient capacity to ensure that the pressure vessel is not exposed to a pressure greater than that specified in the original code of construction.

4.7.5 SET PRESSURE
a) When a single relief device is used, the set pressure marked on the device shall not exceed the maximum allowable working pressure.

b) When more than one pressure relief device is provided to obtain the required capacity, only one pressure relief device set pressure needs to be at the maximum allowable working pressure. The set pressure of the additional relief devices shall be such that the pressure cannot exceed the overpressure permitted by the code of construction.

4.7.6 INSTALLATION AND DISCHARGE PIPING REQUIREMENTS
a) When a discharge pipe is used, the cross-sectional area shall not be less than the full area of the valve outlet or the total of the areas of the valve outlets discharging there into.

b) When two or more required pressure relief devices are placed on one connection, the inlet cross-sectional area of this connection shall be sized either to avoid restricting the flow to the pressure relief devices or made at least equal to the combined inlet areas of the pressure relief devices connected to it.

c) There shall be no intervening stop valve between the vessel and its pressure relief device(s), or between the pressure relief device and the point of discharge.

d) Pressure relief device discharges shall be arranged such that they are not a hazard to personnel or other equipment and, when necessary, lead to a safe location for the disposal of fluids being relieved.

e) Discharge lines from pressure relief devices shall be designed to facilitate drainage or be fitted with drains to prevent liquid from collecting in the discharge side of a pressure relief device. The size of the discharge lines shall be such that any pressure that may exist or develop will not reduce the relieving capacity of the pressure relief device or adversely affect the operation of the pressure relief device. It shall be as short and straight as possible and arranged to avoid undue stress on the pressure relief device.

4.10 TESTING AND ACCEPTANCE

4.10.1 GENERAL
a) Care shall be exercised during installation to prevent loose weld material, welding rods, small tools, and miscellaneous scrap metal from getting into the thermal fluid system. Where possible, an inspection of the interior of the thermal fluid heater and its appurtenances shall be made for the presence of foreign debris prior to making the final closure.

b) Safe operation should be verified by a person familiar with heater system operations for all heaters and connected appurtenances and all pressure piping connecting them to the appurtenances and all piping.

c) In bolted connections, the bolts, studs, and nuts shall be marked as required by the original Code of Construction and be fully engaged (e.g., the end of the bolt or stud shall protrude through the nut).

d) Washers shall only be used when specified by the manufacturer of the part being installed.
**S4.10.2 Pressure Test**

Prior to initial operation, the completed thermal fluid heater system, including pressure piping, pumps, stop valves, etc., shall be pressure tested in accordance with the manufactures recommendations. Hydrostatic testing of the system is not recommended due to possible contamination of the system. All pressure testing should be witnessed by an Inspector.

**S4.8.3 Nondestructive Examination**

Thermal fluid heater components and subcomponents shall be nondestructively examined as required by the governing Code of Construction.

**S4.8.4 System Testing**

Prior to final acceptance, an operational test shall be performed on the complete installation. The test data shall be recorded and the data made available to the jurisdictional authorities as evidence that the installation complies with the provisions of the governing code(s) of construction. This operational test may be used as the final acceptance of the unit.

**S4.8.4 Final Acceptance**

A thermal fluid heater may not be placed into service until its installation has been inspected and accepted by the appropriate jurisdictional authorities.

**S4.8.5 Installation Report**

a) Upon completion, inspection, and acceptance of the installation, the installer should complete and certify the *Boiler Installation Report I-1*. See 1.4.5.1.
b) The *Boiler Installation Report I-1* should be submitted as follows:
   1) one copy to the Owner; and
   2) one copy to the Jurisdiction, if required.
Comments Must be Received No Later Than: December 17, 2012

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: December 14, 2012

Commenter Name: Richard Craig, CGA Technical Director

Commenter Address: The Compressed Gas Association, Inc.

                      14501 George Carter Way, Suite 103, Chantilly, VA 20151

Commenter Phone: (703) 788-2730

Commenter Fax: 703-961-1831

Commenter Email: r craig@cgai.net.com

Section/Subsection Referenced: Supplement 3, S3.6, Valves, Piping, Tubing and Fittings


S3.6 VALVES, PIPING, TUBING AND FITTINGS

Safety Relief/Vent Lines-Safety relief/vent lines shall be as short and straight as possible with a continuous routing to an unenclosed area outside the building and installed in accordance with the manufacturer's instructions. The vent line shall be a continuous run from the vessel PRD vent piping to the outside vent line discharge fitting, without any splices. Mechanical joints in metallic piping and tubing shall be visible and inspectable. Any splices in plastic or polymeric tubing shall be done within three feet of the vessel and must be visible and inspectable. These lines shall be free of physical defects such as cracking or kinking and all connections shall be securely fastened to the LCDSV and the fill box. The minimum size and length of the lines shall be in accordance with table S3.6a and S3.6b. Fittings or other connections may result in a localized reduction in diameter have been factored into the lengths given by the tables S3.6a and S3.6b.

Rationale: Allows the use of connectors but requires that they are seen and can be inspected for verification of integrity.

Source: ☑ Own Experience/Idea ☑ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR13-06 Committee Referred To:

Comment No. Issued: 02 SC Installation
Gentlemen;

As a result of the reminder that I sent and the overwhelming response that I received, the subject public review comment has been rejected. I will respond to the commenter that the Committee responded with a "6, Rejected". An action item has been opened to address this issue further in the Installation Subcommittee. Let me know if you have any questions.

Thank you,
Robin Hough
NBIC Committee Coordinator
The National Board of Boiler and Pressure Vessel Inspectors
1055 Crupper Avenue
Columbus, OH 43229
614-888-8320 x 228
614-431-3236 Direct Line
Gary Scribner's Email - FW: PR13-0602
Jim Pillow
to:
RHough
01/30/2013 02:02 PM
Show Details

Robin, here's the email I mentioned.

Jim Pillow
Common Arc Corporation
67 Wyndemere Lane
Windsor, CT 06095
Email: jpillow@commonarc.com
PH: 860-688-2531
Fax: 860-688-2531
Cell: 860-539-9160

From: Scribner, Gary [mailto:Gary.Scribner@dps.dps.mo.gov]
Sent: Wednesday, January 30, 2013 10:13 AM
To: 'banthony@dlt.state.ri.us'; 'breetz@state.nd.us'; 'bryan.schulte@nrgenergy.com'; 'canonicod@epbfi.com';
'chopkins@seattleboiler.com'; 'DCook@dir.ca.gov'; 'fhart@furmanite.com';
'ggalanes@diamondtechnicalservices.com'; 'HMICHAELRICHARDS.PE@GMAIL.COM';
'jim.riley@conocophillips.com'; 'jpillow@commonarc.com'; 'jsekely@comcast.net'; 'jwrichar@aol.com';
'Lmac@glabap.com'; 'Mark.Mooney@Liberty Mutual.com'; 'mike.webb@xcelenergy.com';
'paul.edwards@shawgrp.com'; 'pcbourge@travelers.com'; 'ralph.pate@labor.alabama.gov';
'raymond.snyder@arisenc.com'; 'RLPulliam@babcock.com'; 'Robert_Wielgoszinski@hsbct.com';
'stanleys@dot.gov'; 'TParks@nationalboard.org'
Subject: PR13-0602
Importance: High

Gentlemen,

Normally I would stand by the vote of the majority of the committee even when my view may differ. As you all know I have a lot of time and effort invested in this important supplement, so I want to make sure we do not give bad direction on how to properly install these systems for obvious safety reasons. As I stated at the at the Main Committee Meeting, I feel that a new action item should be opened and the current wording should stay as is for now. I still have concerns with wall penetrations however after having time to take a step back and review the proposal by PRD I have found a much larger flaw with the proposed wording. The following proposed wording is where the bigger issue lies, “The vent line shall be a continuous run from the vessel PRD vent piping”.

A good percentage of these systems have a PRD installed in the fill line. The proposed wording would seem to exclude any coverage on the proper installation of this PRD and the point of discharge for the discharge line and could cause serious safety risk. This PRD is not a vent circuit as per say, but is exposed to the fill pressure from the truck.

I would ask that you please review this item closely, and consider changing your vote to have this Public Review Comment addressed in a new item so that all relevant concerns can be addressed.

Should you need more information on this subject please feel free to contact me.

file:///C:/Users/rheilman/AppData/Local/Temp/notesFFF692/~web0607.htm
PR13-06 02 Negative
Scribner, Gary
to:
RHough@nationalboard.org
01/17/2013 02:16 PM
Show Details

I voted negative on the committees approval as "Accepted, changes are incorporated" for the following reasons;

This is a supplement in the NBIC, even though it concerns PRV piping it is not technically a PRV issue. It is a installation issue. The PRV committee should have at least consulted the task group to get a understanding on why the text was put in the ballot and why. This approval not only leaves some installation issues uncovered but in my opinion new technical information was added beyond what was in the public review comment. Even as approved by main committee new technical information added to the document for publishing is a violation ANSI process and NBIC procedures since no public review will be provided for this new technical information.

Gary Scribner