



State of New Jersey

DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

Division of Public Safety and Occupational Safety & Health
Bureau of Boiler and Pressure Vessel Compliance

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BOILER REGULATION ADVISORY

Subject: Use of a Backflow Preventer in Boiler Applications

In accordance with the regulatory authority granted by the Boiler, Pressure Vessel and Refrigeration Laws, this advisory is being issued to ensure safety of the general citizenry in the installation, repair and operation of boiler plants which includes the appurtenances, devices, controls or any items that directly or indirectly impacts upon the regulated equipment that could potentially pose a hazard to the public. Specifically this advisory addresses the use of a Backflow Preventer (BFP) in all boiler related applications.

This Advisory responds to numerous inquiries that have been submitted concerning the position of the Bureau of Boiler and Pressure Vessel Compliance (BB&PVC) on the acceptance of ASME interpretation IV-95-02, future ASME Code addenda regarding BFP, and other written requests for an official determination on the acceptable use of a BFP in boiler applications that fall under the BB&PVC's jurisdiction.

The BB&PVC does not concur with ASME Code interpretation, IV-95-02 and officially declares any future ASME Code addenda allowing such installation as invalid for the reasons that follow. The BFP and the check valve is designed for two disparate purposes and made to accomplish two distinct functions. The check valve required by Section IV, HG-705 (a) (b), is intended for the sole purpose of preventing the water in the boiler from being forced out under pressure in the event of a piping break or loss of supply pressure. The backflow preventer is intended for the sole purpose of preventing normally contaminated (undrinkable) water found in the boiler from back-flowing into the potable water system as is required by the plumbing codes.

The BB&PVC staff has thoroughly reviewed product information from the manufacturer of a commonly used BFP. According to this manufacturer's documentation and information obtained from their corporate technical staff, their BFP has rubber-to-metal valve internals that would not be able to tolerate an incidental temperature excursion of 250°F without failing. These types of excursions might be experienced by low-pressure boilers during abnormal or malfunctioning conditions and as a result would melt the rubber internal components, which according to the design of the BFP would open the port to the atmospheric vent so as to prevent the undrinkable boiler water from contaminating the potable water supply. When this vent opens it creates an unacceptable event for boiler operation, because the melting internal component in the BFP puts the boiler at risk for a dry-firing condition which could result in a catastrophic failure or a boiler explosion.

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For obvious reasons, the melting of protective components is not acceptable for safety and contradicts the logical reasoning for the installation of a standard boiler check valve. Acceptable engineering practices requires that the valves, devices, controls and other similar appurtenances or appliances attached to the boiler or that are an integral part of the boiler, be engineered to prevent a catastrophic failure. Clearly, the BFP installed by itself in the potable water supply line to a boiler defeats the practical safety applications meant for the various devices and components used in boiler systems.

The BB&PVC as the jurisdictional authority has determined that the installation of the BFP the way it is presently ¹engineered, must not be used by itself in the potable water supply line to the boiler as a replacement for the simple design and standard issue metal seated check valve. In addition, when the installation of the BFP is required by the plumbing codes in the potable water supply or makeup line to the boiler, it shall include the standard check valve as required by the ²boiler safety codes and standards. Thus, the required metal seated and standard check valve must be installed downstream of the BFP, and include a shut-off valve next to the boiler and be located downstream of the standard check valve for system isolation and maintenance purposes. See the supplemental document **BPVC_ADVY2-5.2009** for guidance on the proper layout.

Rev.
5.09

Therefore, in accordance with N.J.A.C. 12:90-4.2 (e), where it states that "only standards relating to public safety are adopted by any incorporation by reference as prescribed etc". The BB&PVC has conclusively determined that ASME Code Interpretation IV-95-02 and any subsequent Code addenda or revisions regarding this Advisory topic is not in the best interest of public safety for boiler operation thus is ruled invalid. Therefore, in accordance with this advisory any standard check valve and shut-off valve found to be installed in any other manner described herein shall be deemed to be in violation of the BB&PVC regulations and the owner will be subject to a monetary per diem penalty assessment until abatement of the violation occurs.

All questions regarding this advisory should be directed to the BB&PVC by calling (609) 292-2921; by email to the Bureau Chief: MiltonWashington@dol.state.nj.us; by Fax at (609) 984-1577, or by written request to the address below.

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Signed:



Chief, BB&PVC

¹ The BB&PVC recognizes that technological advances occur that could address the safety concerns of this Advisory and that improvement in the BFP is possible. However, until advances are made in the design of the BFP to address the concerns expressed, this Advisory shall be enforced and in effect until deemed otherwise necessary.

² See 2004 ASME Code or any earlier code edition of Section IV, "Rules for the Construction of Heating Boilers" at paragraph HG-705 for the installation detailed in this Advisory. Until proven otherwise, this Advisory renders paragraph HG-705 of the 2006 ASME Code Addenda and future revisions invalid when the design of a BFP is of the type as specified in this Advisory.