

Hot water heating/supply boiler inspection and maintenance

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With the advent of more complex and automatic safety devices for this equipment, there are still cases every year where hot water boilers cause property damage, personnel injuries, and extensive loss of income due to business interruption.

Introduction

Even as our society changes to a modern, fast-paced financial environment, many entities still use hot water heating and supply boilers in various types of applications today. As long as society has the need for a large supply of hot water in a short period of time, there will be applications for this type of equipment.

Discussion

Zurich Services Corporation Risk Engineering takes the use of this equipment and its care very seriously and provides a group of risk engineers dedicated to protecting both personnel and property by performing regular equipment assessments designed to help safeguard against boiler losses and accidents. However, safe boiler operation not only needs the watchful eye of a third party, but the commitment of the boiler owner to operate this type of equipment in a safe and efficient manner. Boiler manufacturers have developed many automatic devices and improved upon them over the years to help the owner do this, but the owner/operator needs to understand and properly care for this type of equipment to ensure its operational effectiveness.

Guidance

Relief valve– The Pressure Relief Device (PRD) is the primary safety device installed on low-pressure boilers to protect against boiler overpressurization. Manufacturers design the PRD to relieve all of the pressure the boiler can generate. However, unless the PRD is tested on a regular basis, the reliability of this essential safety device cannot be assured. When the boiler is in operation, manually test the safety valve by lifting its test lever. Verify that the valve lifts and seats properly. The relief valve must be replaced if found to be leaking or in an unreliable condition. An alternate method of testing the low-pressure boiler safety valve is to remove it from the boiler during the boiler maintenance period and send the PRD to an ASME-accredited testing facility for bench testing. In either case, the boiler owner should have a program in place that ensures regular testing of this important safety device.

Pressure and temperature gauges– The boiler pressure and thermometer gauges allow the operator to verify the system pressure and temperatures. The high temperature operating and limit controls are used to operate and limit the temperature within the boiler and heating system to safe ranges. To prevent overheating, a low-level or flow sensing control device is installed to shut down the burner in the event of leakage or interrupted water flow that inhibits the normal operation of the heating system.

Burner operation – flame failure scanner - To prevent boiler fireside explosions, the boiler owner/operator must verify that some type of flame-sensing device is in use to ensure that flame conditions are safe on the boiler burner side. In the event of flame failure during operation, the flame-sensing device must be capable of stopping the boiler fuel supply, initiating an alarm and causing an air purge of the boiler fireside passes to remove latent fuel fumes from the boiler's firesides.

Check the burner operation and flame pattern regularly and flame failure scanner periodically, preferably at least weekly. In general, on the burner, listen for unusual noise, check for fuel leaks, check the position of dampers, and look or smell for indications of flue gas leakage. Observe the boiler stack temperature to verify it is within the normal operating range. Follow the boiler manufacturer's guidelines and the ASME CSD-1 Code for burner maintenance and testing of the flame failure scanner. If the burner shows any indications of abnormal operation, contact your boiler repair contractor.

Boiler room tour - A regular tour through the boiler room should include a walk around the boiler to observe water level, any water leakage, signs of overheating, or evidence of soot or flue gas leaks. Boiler rooms should be kept free of debris and should not be used as general storage areas.

Conclusion

There are other devices used on low-pressure steam boilers that are very important to the boiler's safe and efficient operation – temperature gauges, pressure gauges, fan controls, etc. to name a few. All of these devices have maintenance requirements that are just as important as the maintenance to the automatic safety devices and should be maintained just as rigorously to ensure proper boiler operation. Care for all of these devices should always be left to a fully qualified boiler contractor or mechanic trained in the operation and testing of steam boiler equipment.

In addition, the boiler owner/operator should never hesitate to contact his/her assigned Zurich risk engineering consultant or the Zurich Machinery Breakdown Hotline at 800-562-5814 for any questions that may arise regarding the application of local boiler codes and/or safety rules enforced where the equipment is installed. **!Head 4 style sheet – !Body copy.** Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio dignissim qui blandit praesent luptatum zzril delenit augue dui dolore te feugait nulla facilisi.

References

1. National Board of Boiler & Pressure Vessel Inspector's Code.
2. ASME Boiler & Pressure Vessel Code, Section VI and CSD-1.

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