BOILER REFRESHER TRAINING

Sponsored by the School Pool for Excessive Liability Limits

Joint Insurance Fund

SPELL - JIF

Course Outline

- Format: Open discussion, shared experiences
- Compliance requirements
- Boiler types
- Basic boiler function
- Critical system components
- Log book entries
- Housekeeping
- Emergency Response Plan

Module One – Compliance

It’s the Law…

N.J.S.A. Title 34:7-1 to 34:7-36
ENGINEER AND FIREMAN LICENSING; BOILERS, PRESSURE VESSELS AND REFRIGERATING PLANTS

and

N.J.A.C Title 12:90.1-1 to 12:90.10-3
BOILERS, PRESSURE VESSELS AND REFRIGERATION

What criteria will trigger the need for a licensed operator to be present in a building?

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12:90-3.3 Equipment requiring a licensed operator
(a) Any person operating the equipment listed below shall have the appropriate license as specified in *N.J.A.C. 12:90-3.4* through *3.8*.

1. Any steam boiler, steam generator, hot water boiler for service over 250 degrees Fahrenheit, or similar equipment potentially capable of generating steam having a safety valve or valves set higher than 15 pounds per square inch gauge and rated over six horsepower;

2. A steam or hot water heating plant with an indicated or rated capacity that exceeds either 499 square feet of heating surface or 100 boiler horsepower or 1,000 kilowatts or 4,000,000 BTU input regardless of pressure or temperature conditions, **and only when the building or building being served is deemed occupied;**

There are exceptions…read the statute

What is the definition of an “occupied” building?

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12:90-2.1 Definitions

“Occupied building" means a building which is occupied by persons other than custodial or security personnel. A building is not deemed to be occupied solely on the basis of attendance by custodial or security personnel.

What are the duties of a licensed operator?

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12:90-3.10 Duties of licensed persons

(c) – Each low pressure boiler operator shall not jeopardize the safe operation of a low pressure heating boiler and shall remain on the premises.

(d) – At a minimum, the operator shall monitor the conditions of the low pressure boiler plant twice every 24 hours, with no less than....

A. Eight hours between each equipment check
B. Two hours between each equipment check
C. Seven hours between each equipment check
D. Once a shift

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What are the duties of a licensed operator?

(f) A boiler operator's log shall be maintained in each plant containing over 100 horsepower. Every operator on the shift shall review the log and, at the end of each shift, shall sign the log. All logs shall include the date, name of the operator(s) on duty, and time of relief. Any personnel who are training to obtain their licenses under the requirements of *N.J.A.C. 12:90-8.4* shall include within the log the actual time spent as a trainee. When the operator of a low pressure plant is not in the boiler room, as permitted in (c) above, the operator shall indicate in the log periodic tours of the boiler plant as required in (d) above.

(2) – Low pressure boiler operator logs shall contain at a minimum the information as outlined in ASME Section VI, Recommended Guidelines for the Care and Operation of Heating Boilers, paragraph 6.09(b), incorporated herein by reference.

Logbook Type & Entries

GUIDELINES FOR

LOGBOOKS

COMPLIANCE TO BOILER

REGULATIONS N.J.A.C. 12:90

Department of Labor and Workforce Development

Labor Standards & Safety Enforcement

Division of Public Safety

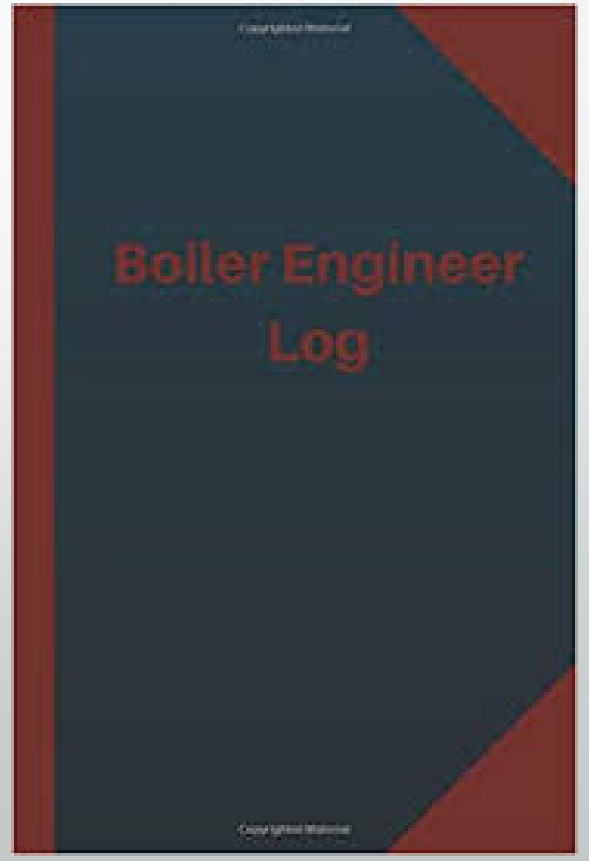
and

Occupational Safety & Health

Bureau of Boiler and Pressure Vessel Compliance

Logbook Type & Entries

- ✓ Must include bounded pages
- ✓ Record primary system information such as:
  - ❖ System pressure
  - ❖ System temperature
- ✓ Document and report any issues



Is all this regulation really necessary?

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. . . . . it has been shown how engineering knowledge and skill have triumphed over superstition and ignorance in explaining and preventing lethal boiler explosions such as those of the last century. *JIHVE, 33, November 1965, p13.*

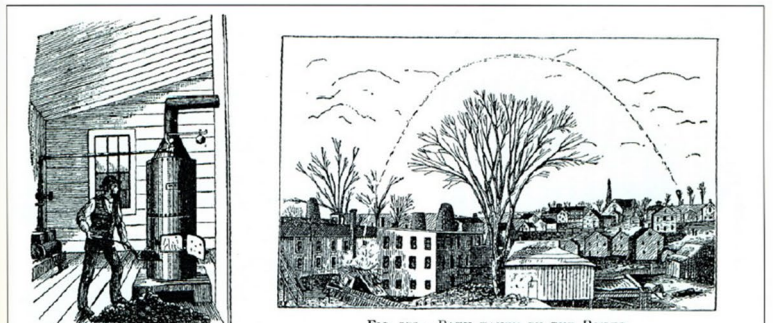
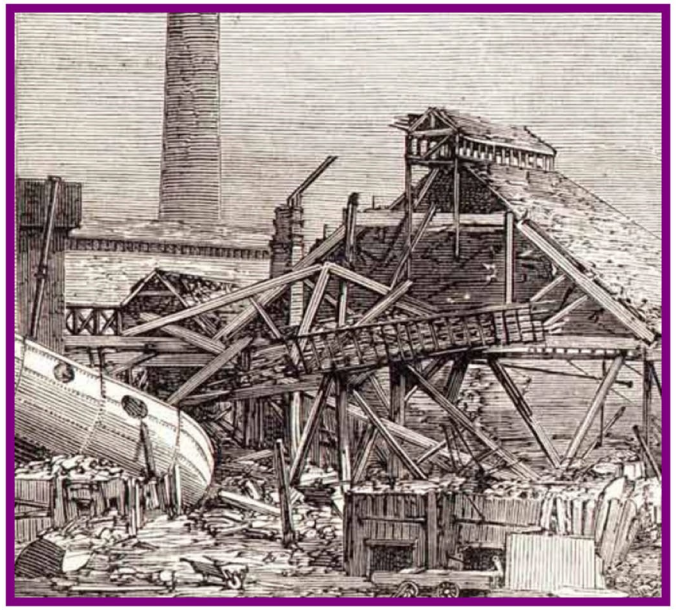


FIG. 170.

FIG. 171.—PATH TAKEN BY THE BOILER.

33. The Disastrous Effects of a Boiler Explosion, c1890. In Great Britain, between 1882 and 1893, there were 660 boiler explosions, resulting in 313 deaths. Heating and Ventilating Buildings, R C Carpenter, 1910, p205.

The Disastrous effects of a Boiler Explosion, c.1896
"The Quest for Comfort," Brian Roberts (CIBSE Centenary) 1997



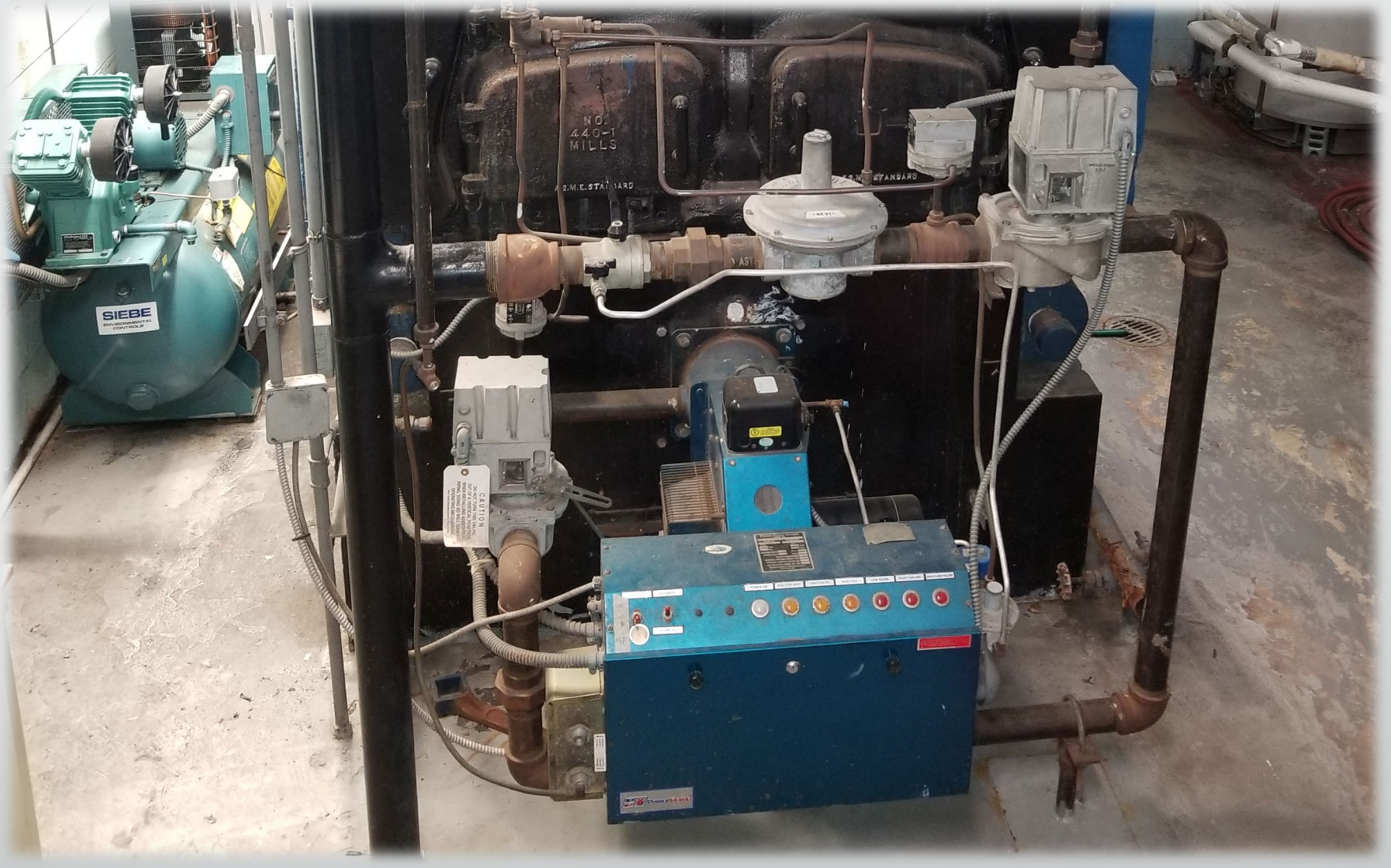
After the Boiler Explosion at the Millfield Iron Works, Wolverhampton
Illustrated London News, April 1852

Module Two – Systems

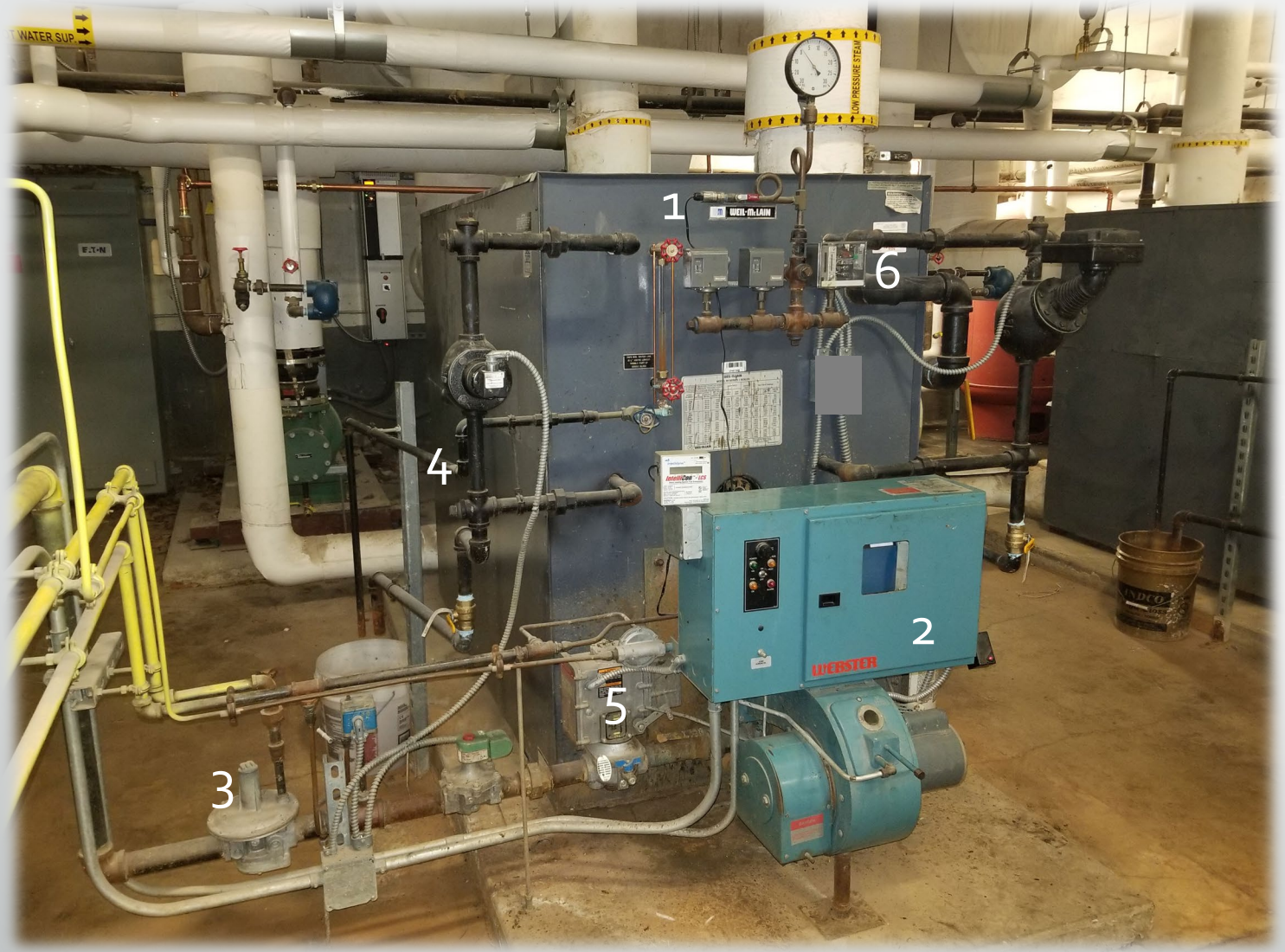
Boiler Types…
…From Then to Now

System Components

Natural Gas Burner



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____



1. _____
2. _____
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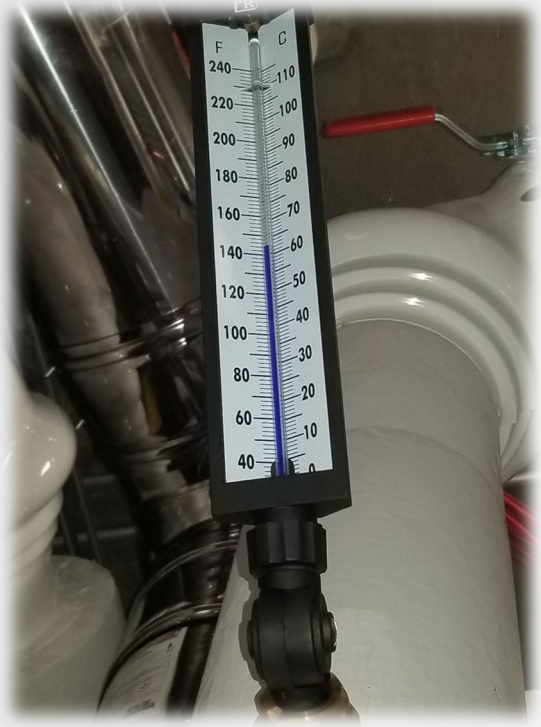
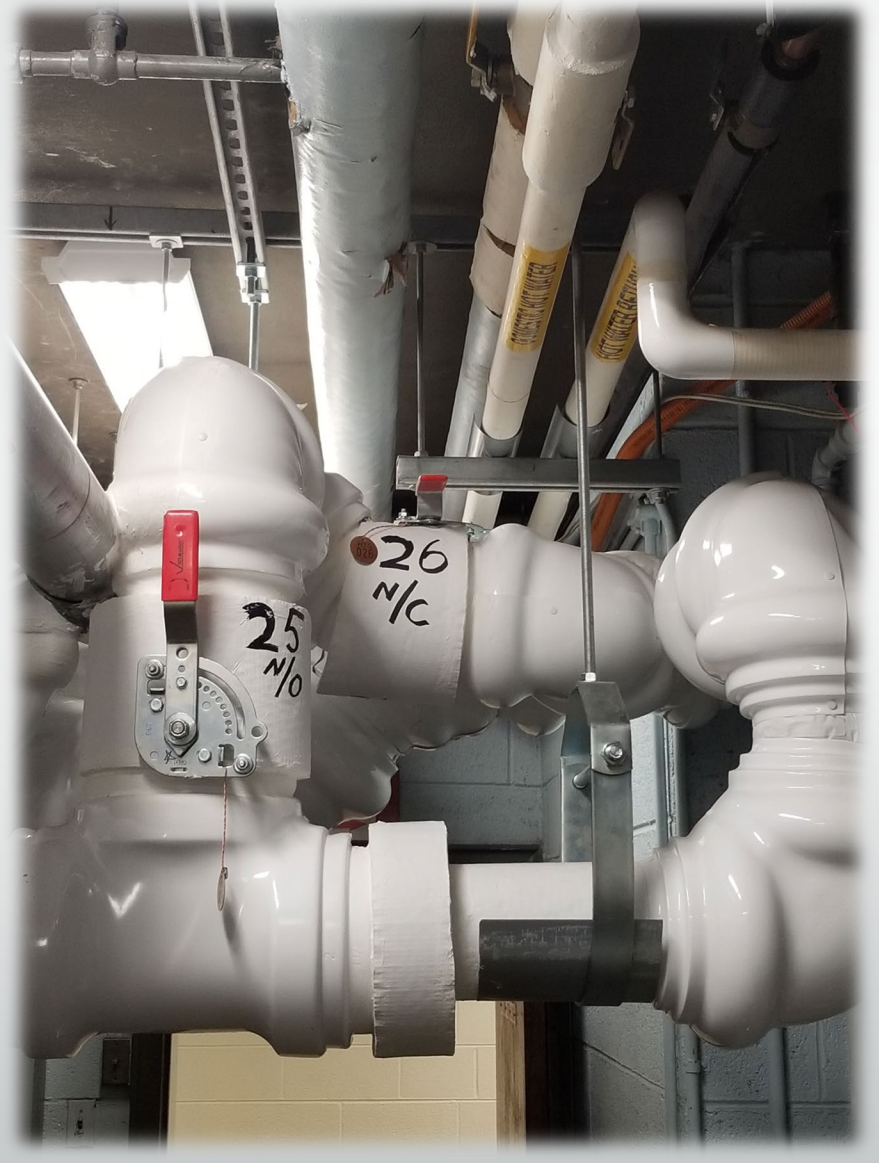
6. _____

Circulation Pumps & Pump Drives (VFD's)

System Information



Isolation Valves



Boiler Status Displays

Variable Frequency Drive (VFD) Displays

Plant Controls

Module Three – Protection Devices & Deficiencies

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Protection Devices

Examples of Plant Deficiencies

Examples of Plant Deficiencies

Module Four – Best Practices

Suggested Best Practices

- ✓ Become familiar with normal boiler room conditions
  - ➢ Sites
  - ➢ Sounds
  - ➢ Smells
- ✓ Know the location & function of critical system components
- ✓ Proper labeling

Emergency Response Plan

- ✓ Create a written plan. Provide a copy of the plan to all custodial and maintenance staff (including service contractors)
- ✓ Avoid creating an emergency plan during an “emergency”
- ✓ Plan should be reviewed prior to every heating season
- ✓ Expose custodial staff to “normal” boiler room conditions, i.e. gauge readings, the sound of pumps and burners when they are functioning properly
- ✓ The plan should include the proper boiler/pump shut-down (outside of pressing the e-stop) and start-up sequence. Do not simply hand the plan to staff. Personally train custodial/maintenance staff on how to the proper boiler/pump shut-down (outside of pressing the e-stop) and start-up sequence.
- ✓ The plan should include the expected response during and after an electrical power outage.
- ✓ Exercise the plan annually.

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Open Discussion