

## DIRECTIVE 15H-4

Issue date: May 2017

### **BOILER SYSTEMS**

(Includes Steam, Hot Water and High Temperature Hot Water Generators)

1. See Directive 1D-8 “NYS and EPA Permitting Requirements for Air Contamination Sources” for boiler permitting information.
2. See Directive 15H-3 “Hydronic Systems” for pumping system requirements.
3. See Directive 15P-1 “Natural Gas Service” for additional requirements related to boilers.
4. Make-up water source shall be protected by a reduced pressure zone backflow preventer.
5. Water treatment shall be provided. Coordinate type and provider of water treatment with Campus to be consistent with existing treatment utilized by the Campus.
6. Multiple boilers shall be considered. If required, staged sizing shall be provided to match varying annual load as efficiently as possible and avoid boiler short cycling. Boiler type shall be with the Fund and Campus approval.
7. Confirm with the Campus the requirements for redundancy in boilers. Facilities conducting research are expected to have a higher concern for redundancy than facilities performing primarily teaching activities.
8. Blowdown to drain shall be a maximum of 140°F. An automatic drain cooler system shall be used to control temperature.
9. Design temperature change across the boiler shall be 20°F - 40°F on low temperature systems. Minimum return water temperature shall be 145°F for non-condensing boilers.
10. When condensing boilers are used, design water temperatures should be selected to maximize efficiency from boilers operating in condensing mode the maximum amount of time possible.
11. Supply an acid neutralization system for condensate from condensing boilers.

12. Burner designs (new and retrofit) shall comply with the NYS Department of Environmental Conservation Regulation 6NYCRR Part 227.
13. Specific choices of fuel types and dual fuel capability must be made with the concurrence of the Campus and the Fund.
14. Utilize modulating burners wherever possible.
15. Natural gas fuel trains shall comply with GE GAP Global guidelines, GAP.4.1.0 and GAP.4.1.3 (These guidelines replace IRI {Industrial Risk Insurers} requirements).
16. Steam boilers shall produce steam at the lowest pressure to meet the needs.
17. If pressure reducing valves are necessary, provide parallel valves sized for 1/3 and 2/3 of the load where capacities are 10,000 lbs/hr and greater, or where the variance between maximum and minimum load is 10 to 1, or greater.
18. Noise level from pressure reducing valve stations, either single or parallel, shall not exceed 70 dBA five (5) feet away from the valves with the specified piping insulation installed. Use sound attenuation blankets to reduce levels.
19. For new boiler installations and burner/boiler controls replacements on existing boilers, provide a coordinated burner control and boiler operation control system to maximize operating efficiency and assure safe operations of the boiler system. Commissioning of boiler and burner controls and boiler operation is required to demonstrate coordinated efficient boiler operation. This service is typically provided by a boiler systems controls integrator.
20. No boiler shall be operated until an internal and external inspection has been made per the NYS Department of Labor Code Rules 4 and 14.
21. Boilers shall be supplied with inspection access ladders, platforms and catwalks to permit inspection per NYS Department of Labor Code Rules 4 and 14. Factory supplied components, if available, shall be provided.
22. Breechings shall be metallic and shall be rated for the application's service conditions. Breeching external to the building shall be double wall or insulated.
23. Boiler burners and fuel feed controls shall have a local, lockable means of electrical disconnect as required by ASME CSD-1.

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24. Boiler emergency shutdown for boilers with a fuel input of 12,500,000 Btu/hr or less, shall be provided by a manually operated, remote shutdown switch(es) located at the boiler room personnel access door(s). Activation of the emergency shutdown switch shall immediately shut off the fuel or energy supply to all boilers in the boiler room as required by ASME CSD-1.  
Use NFPA 85 for boilers with a fuel input greater than 12,500,000 Btu/hr.

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