

APPENDIX B INSPECTION AND TESTING FOR BOILER PLANT OPERATIONS**1. INSPECTIONS/TESTING MUST BE CONDUCTED IN ACCORDANCE WITH THE FOLLOWING:**

a. **Inspection/Testing.** Testing and inspection must be executed and documented by a qualified boiler operator, or the required services may be procured from a qualified inspector if required.

(1) Hydrostatic testing of boilers and pressure vessels must be conducted after a repair or a tube replacement, or when the boiler or pressure vessel integrity is in doubt. Hydrostatic pressure must be limited to 150 percent of normal operating pressure of the boiler or pressure vessel.

(2) Selections of contractors for plant services including boiler inspections, burner adjustments, testing of safety devices, calibration of instruments, and monitoring of water treatment must be based on quality of work and experience as the first priorities.

b. **A Qualified Professional Inspector (QPI).** A QPI is any one or combination of the following:

(1) A boiler inspector who has a valid and current certificate from the National Board of Boiler and Pressure Vessel Inspectors;

(2) A boiler inspector who has qualified for licensure by passing a written examination under the laws, rules, and regulations of a jurisdiction of the State and holds a current State license;

(3) A boiler inspector who is currently employed as a boiler inspector/testing by a jurisdiction that has adopted and administers one or more sections of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code as a legal requirement, and has a representative serving as a member of the ASME Conference Committee; or

(4) A boiler inspector who is currently employed by an insurance company that has been licensed or registered by the appropriate authority of a State to write boiler and pressure vessel insurance.

2. TABLE OF REQUIRED INSPECTIONS AND OPERATIONAL TESTS:

a. **Key to Frequency Abbreviations.**

(1) H = Hourly;

(2) D = Daily;

(3) M = Once per month;

(4) 6M = Once every 6 months;

(5) Y = Once per year; and

(6) 6Y = Once every 6 years.

b. **Frequency Chart.** **NOTE:** *Items 12 through 13.I. are Boiler Plant Safety and Operational Duties.*

Number	Item	Frequency
1	High pressure boilers (15 gauge psig or greater): Inspect furnace and other internal surfaces, closures and accessories	Y
2	High pressure boilers (15 gauge psig or greater): Inspect exterior of Unit, casing, supports, closures, accessories, valves, controls	Y
3	Deaerator: Inspection and wet magnetic particle testing of welds of pressure vessel interior	6Y
4	All Boilers for fouling and combustion gas flow check	Y
5	Tube leak check on all boiler types	Y
	NOTE: <i>Items 1 through 5 in this table must be accomplished by a documented Qualified Professional Inspector. Items 6 through 12 must be accomplished by a qualified inspector as determined by local VA medical facility management staff. Such a determination must be carefully made for each item and each individual.</i>	
6	Deaerator: Interior cleaning and visual inspection	Y
7	Adjust burner combustion settings and calibrate oxygen trim	6M
8	Check vibration of burner fans	6M
9	Calibrate instrumentation, monitoring, and control systems	6M
10	Calibrate pressure gages and thermometers	Y
11	Operational Testing of Boiler Safety Devices:	Y
11a	Low-water cutoff (slow drain)	M
11b	Fire each boiler and the pilot on the alternate fuel for 1 hour	M
11c	Low-water cutoff shunt switch	M
11d	Auxiliary low-water cut-off (slow drain)	M
11e	Auxiliary low-water cut-off shunt switch	M
11f	High-water alarm	M
11g	Low-water alarm	M

11h	High-steam pressure cut-out (recycle)	6M
11i	High-steam pressure cut-out (non-recycle)	6M
11j	Steam safety valves (accumulation test at high fire)	Y
11k	Flame scanner	M
11l	Check gas vent for leaks	6M
11m	High-gas fuel pressure cut-off	6M
11n	Low-gas fuel pressure cut-off	6M
11o	Gas fuel safety shut off valves proof of closure	6M
11p	Leak test gas fuel safety shut off valves	6M
11q	High-fuel oil temperature cut-off (heated fuel)	6M
11r	Low-fuel oil temperature cut-off (heated fuel)	6M
11s	Low-atomizing pressure for fuel oil	6M
11t	High-fuel oil pressure cut-off	6M
11w	Fuel oil safety shut off valves proof of closure	6M
11x	Leak test fuel oil safety shut off valves	6M
11y	Check operation of Liquid Petroleum Gas pilot	6M
11z	Low-pilot gas pressure cut-out	6M
11aa	Forced draft fan motor interlock	6M
11bb	Forced draft fan damper wide open for purge	6M
11cc	Boiler outlet damper wide open for purge	6M
11dd	Purge air flow interlock	6M
11ee	Timing for pre-purge	6M
11ff	Timing for post-purge	6M
11gg	Igniter timing	6M
11hh	Low fire position interlock	6M
11ii	Combustion air interlock	6M
11jj	Main flame out; i.e., time to close valves	6M
11kk	Ignition flame out; i.e., time to close valves	6M
11ll	Minimum igniter flame test	6M
11mm	Scanner not sensing ignition spark	6M
11nn	Low-oxygen alarm and/or cut-out	6M
11oo	Pre-purge setting of flue gas recirculation damper	6M
11pp	Interlock of building outside air damper with burner controls	6M
11qq	Burner control	6M

**	NOTE: The preceding safety devices are essential for ensuring the safest possible operation. Any boilers not so equipped must be immediately programmed for retrofit, with priority given to providing two low water cutoffs per boiler and two fuel safety shut off valves per fuel per boiler.	
12	Overall plant operation (Logs must be taken by hand even if automatic logs or SCADA system is in place)	H
12a	The equipment number of systems operating	H
12b	Inlet and outlet temperature of all equipment, Condensate, DA, economizer, boiler etc.	H
12c	Inlet and outlet pressure of all operating pumps	H
12d	Plant temperature, outside air temperature, and exhaust gas temperature(before and after economizer if installed)	H
12e	Fuel flow and firing rate for each boiler on line	H
12f	Steam or hot water flow to the medical center	H
12g	DA pressure and temperature	H
12h	Make up water meters	H
12i	Fuel train pressures and flows for each boiler that is on line	H
12j	Boiler pressure or temperature	H
12k	Note any leaks or system problems abnormal operating conditions etc.	H
12l	Header pressure, temperature, and if branches pressure and temperature of each branch leaving the plant	H
12m	Calculated boiler combustion efficiency	H
12n	Other readings as required or determined by the VA medical facility	H
13a	Blow down water columns	D
13b	Testing and adjusting water treatment	D
13c	Check furnace pressure	6M
13d	Check combustion gas leaks into boiler room	6M
13e	Clean waterside of boilers	Y
13f	Clean fireside and repair refractory	Y
13g	Operation of deaerator high and low water alarms	M
13h	Operation of deaerator steam pressure or temperature control	M
13i	Operation of condensate storage tank high and low water alarms	M
13j	Operation of all other alarm devices	M
13k	Operation of boiler economizers; temperatures in or out	D
13l	Review written procedures	6M