

NFPA 85 Training Requirements

NFPA 85 (2019 Edition) – Boiler and Combustion Systems Hazard Code

4.4.3.1 Operator Training

- 4.4.3.1.1 The owner or the owner's representative shall be responsible for establishing a formal training program that is consistent with the type of equipment and hazards involved to prepare personnel to operate the equipment.
- 4.4.3.1.2 Operating procedures shall be established that cover normal and emergency conditions.
 - 4.4.3.1.2.1 Start-up, shutdown, and lockout procedures shall all be covered in detail.
 - 4.4.3.1.2.2 Where different modes of operation are possible, procedures shall be prepared for each operating mode.
 - 4.4.3.1.2.3 Procedures also shall be prepared for switching from one mode to another.
- 4.4.3.1.3 The owner or owner's representative shall verify that operators are trained and competent to operate the equipment under all conditions prior to their operation of such equipment.
- 4.4.3.1.4 The owner or owner's representative shall be responsible for retraining operators, including reviewing their competence, at intervals determined by the owner.
- 4.4.3.1.5 The training program and operating and maintenance manuals shall be kept current with changes in equipment and operating procedures and shall be available for reference and use at all times.
- 4.4.3.1.6 Operating procedures shall be directly applicable to the equipment involved and shall be consistent with safety requirements and the manufacturer's recommendations.

4.4.3.2 Maintenance Training

- 4.4.3.2.1 The owner or owner's representative shall be responsible for establishing a formal and ongoing program, consistent with the equipment and hazards involved, for training maintenance personnel to perform all required maintenance tasks.
- 4.4.3.2.2 Maintenance procedures and their associated training programs shall be established to cover routine and special techniques.
- 4.4.3.2.3 Environmental factors such as temperature, dusts, contaminated or oxygen-deficient atmospheres, internal pressures, and limited access or confined space requirements shall be included in the maintenance procedures.
- 4.4.3.2.4 Maintenance procedures shall be consistent with safety requirements and the manufacturer's recommendations and shall be kept current with changes in equipment and personnel.



ASME CSD-1 and NFPA 85 Testing Requirements

ASME CSD-1 (2015 Edition)

Applies to boilers up to 12,499,000 Btu/hour

CM-110

Operability and set points on all devices, where applicable, shall be verified by periodic testing, and the results shall be recorded in a boiler log, maintenance record, service invoice, or other written record.

NFPA 85 (2019 Edition)

Applies to boilers 12,500,000 Btu/hour and greater

Fundamentals

4.4.1.3 Operation, set points, and adjustments shall be verified by testing at specified intervals, and the results shall be documented.

Single Burner

5.4.2.7.2 Manual valve leakage tests of the main safety shutoff valves shall be conducted at least annually.

Multiple Burner

6.4.1.1.3 Testing and maintenance shall be performed to keep the interlock system functioning as designed.

Typical Interlocks and Safety Devices to Be Tested:

The table below is a list of the common interlocks that are referenced throughout ASME CSD-1 and NFPA 85 which would fall under the annual testing requirement for boilers.

Table A: Common Standard Interlocks to Test

Fuel Train - Burner

1. Low Gas/Oil Pressure
2. High Gas/Oil Pressure
3. Pilot Low Gas Pressure
4. Pilot High Gas Pressure
5. Valve Tightness Tests (Gas/Oil)
6. Main Gas Shutoff Valve
7. Safety Shutoff Valve
8. Vent Valve (Oil N/A)
9. Blocking Valve
10. Downstream Manual Valve
11. Pilot Manual Gas Shutoff Valve
12. Pilot Safety Shutoff Valve
13. Pilot Vent Valve
14. Pilot Blocking Valve
15. SSOV Slow Closure (Gas/Oil)
16. BV Slow Closure (Gas/Oil)
17. Proof of Closure--SSOV (Gas/Oil)
18. Proof of Closure – BV (Gas/Oil)
19. Flame Sensing

Motor Starter Contact Relays

20. Combustion Air Fan
21. Induced Draft Fan

Burner Management Logic

22. Purge Time
23. Pilot Trail for Ignition
24. Main Trail for Ignition
25. Pilot Spark Pick-up
26. Burner Position Switches
27. Post-Purge Time
28. Burner Stop
29. Emergency Stop

Fuel Oil Specific

30. Atomizing Media Pressure
31. Low Oil Temperature

Boiler Interlocks

32. High Oil Temperature
33. Purge Air Proving
34. Minimum Combustion Air
35. Low Fire Proving
36. High Fire Proving
37. Operating Steam Pressure
38. Excess Steam Pressure
39. Instrument Air
40. Low Furnace Pressure
41. High Furnace Pressure
42. Operating Temperature
43. Excess Temperature Limit
44. Low Water Alarm
45. Low Water Cutout
46. Aux. Low Water Cutout
47. High Water Alarm
48. High Water Cutout
49. Flow Proving Switch