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Honeywell Combustion Safety

NFPA 85 Training Requirements

NFPA 85 (2015 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 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 (2012 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 recorded in a boiler log, maintenance record, service invoice, or other written record.

NFPA 85 (2015 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		Motor Starter Contact Relays		Boiler Interlocks
1	Low Gas/Oil Pressure	20	Combustion Air Fan	32	Purge Air Proving
2	High Gas/Oil Pressure	21	Induced Draft Fan	33	Minimum Combustion Air
3	Pilot Low Gas Pressure			34	Low Fire Proving
4	Pilot High Gas Pressure		**Burner Management Logic**	35	High Fire Proving
5	Valve Tightness Tests (Gas/Oil)	22	Purge Time	36	Operating Steam Pressure
6	*Main Gas Shutoff Valve*	23	Pilot Trail For Ignition	37	Excess Steam Pressure
7	*Safety Shutoff Valve*	24	Main Trail For Ignition	38	Instrument Air
8	*Vent Valve (Oil N/A)*	25	Pilot Spark Pick-up	39	Low Furnace Pressure
9	*Blocking Valve*	26	Burner Position Switches	40	High Furnace Pressure
10	*Downstream Manual Valve*	27	Post-Purge Time	41	Operating Temperature
11	*Pilot Manual Gas Shutoff Valve*	28	Burner Stop	42	Excess Temperature Limit
12	*Pilot Safety Shutoff Valve*	29	Emergency Stop	43	Low Water Alarm
13	*Pilot Vent Valve*			44	Low Water Cutout
14	*Pilot Blocking Valve*		**Fuel Oil Specific**	45	Aux. Low Water Cutout
15	SSOV Slow Closure (Gas/Oil)	30	Atomizing Media Pressure	46	High Water Alarm
16	BV Slow Closure (Gas/Oil)	31	Low Oil Temperature	47	High Water Cutout
17	Proof of Closure–SSOV (Gas/Oil)	32	High Oil Temperature	48	Flow Proving Switch
18	Proof of Closure – BV (Gas/Oil)				
19	Flame Sensing				

Honeywell Combustion Safety has been in business since 1984. With engineers and staff members that sit on Code committees such as NFPA 56, NFPA 85, NFPA 86, and NFPA 87, our inside expertise is integrated within all of our practices and our global reach ensures that customers around the world are kept safe. Honeywell Combustion Safety offers Testing and Inspections, Engineering & Upgrades/Retrofits, Gas Hazards Management, Training, and Field Services for all industrial facilities and different types of fuel fired equipment.

Contact Honeywell Combustion Safety at +1 216.749.2992 for additional information.