Second Revision No. 721-NFPA 85-2018 [Global Input]

In Chapter 5,

Change "automatic (i.e., recycling)" to "automatic recycling".

Replace the term "oil fuel" with "fuel oil" in 5.7.3.3(2), 5.8.3.2(1), and 5.8.4.2(3)

Replace "gas fuel" with "fuel gas" in 5.7.3.4(2), 5.8.3.3(1), and 5.8.4.3(3)

Submitter Information Verification

Submitter Full Name: Lisa Hartman
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jan 19 16:47:29 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The requested global Chapter 5 changes to language are being made to be consistent with the defined terms in Chapter 3.

Response Message:

Public Comment No. 20-NFPA 85-2017 [Global Input]

Second Revision No. 723-NFPA 85-2018 [Section No. 5.4.5.5]

5.4.5.5

~~Airflow demand shall not be reduced below the low limit of the fuel-burning system as determined by the burner manufacturer and verified by operating test.~~

5.4.5.5.1

The requirements in 4.13.2.1 shall not apply.

5.4.5.5.2

The airflow demand shall not be reduced below the low limit of the fuel-burning system as determined by the burner manufacturer and verified by operating test.

Submitter Information Verification

Submitter Full Name: Lisa Hartman
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
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Committee Statement and Meeting Notes

Committee Statement: The modified language resolves the conflict between subsection 4.13.2.1 and single-burner boilers.

Response Message:

Public Comment No. 17-NFPA 85-2017 [New Section after 5.4.5.5]

Second Revision No. 713-NFPA 85-2018 [Section No. 5.6]

5.6 ~~Operating~~ Burner Management Systems.

5.6.1* General.

This section shall be used to define requirements for automatic recycling, automatic nonrecycling, and manual supervised burner management systems.

5.6.1.1

Manual systems shall not be installed for new installations or major alterations.

5.6.1.2

Different arrangements shall be permitted if they provide protection and meet the intent of this code. *(See Figure A.5.4.1, Figure ~~A.5.4.2.3~~ A.5.4.2.3.1 , and Figure A.5.4.4.1 for typical arrangements.)*

5.6.2 Automatic ~~(~~ Burner Management System — Recycling~~) Systems~~ .

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5.6.2.1

An ~~automatic (i.e., recycling)~~automatic recycling unit shall not be started from a cold condition unless a trained operator is present. *(See Section 5.5 for instructions on starting a cold boiler.)*

5.6.2.2

Underlying all the requirements of 5.6.2 shall be the premise that the unit is hot and that steam pressure and operating water level shall have been established.

5.6.2.3

The fuel to be fired shall have been manually selected.

5.6.2.4

The alternate fuel system shall be placed in a nonfiring condition, and the manual burner valve(s) shall be closed.

5.6.2.5

An igniter as specified in 5.4.4.1.1 shall be provided.

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5.6.2.6

An ~~automatic (i.e., recycling)~~ automatic recycling unit shall recycle on high steam pressure, high water temperature, or low water level (not determined by the auxiliary low water cutout) and perform four major functions as given in 5.6.2.6.1 through 5.6.2.6.4.4.

5.6.2.6.1 Prefiring Cycle.

The prefiring cycle shall accomplish the following steps in the listed order~~,~~ except that the order of steps (5), (6), and (7) in the sequence shall be permitted to vary:

(1) Prove the main fuel safety shutoff valves are closed.

(2) Prove no flame is present at the burner.

(3) Start the fan.

(4) Satisfy the fan interlock.

(5) Where an atomizing medium is used and if not already on, admit medium to the main burner.

(6) Where an atomizing medium is used, satisfy the atomizing medium interlocks.

(7) Satisfy fuel interlocks.

(8) Prove the purge airflow by satisfying one of the following items:

(a) Air pressure and “open damper” interlocks for all dampers in the flow path

(b) Airflow interlock

(9) Purge airflow must reach no less than 70 percent of the airflow required at maximum continuous capacity of the unit.

(10) During the purge, the air dampers must be driven to their full open positions. Airflow during the period of opening the dampers and returning them to light-off position is permitted to be included in computing the time for the purge.

(a) For watertube boilers, the purge must be for at least eight air changes of the furnace and gas passes.

(b) For firetube boilers, the purge must be for at least four air changes of the furnace and gas passes.

(11) Set controls to light-off position.

(12) Prove the dampers and fuel control valve are in light-off position.

(13) If a flue gas recirculation system is supplied, then purge it ~~shall be purged~~ per the manufacturer's instructions.

5.6.2.6.2 Light-Off Cycle.

5.6.2.6.2.1 Class 3 Igniter.

The light-off cycle for a burner with a Class 3 igniter shall accomplish the following in the listed order:

(1)* Energize the ignition transformer and igniter fuel valves.

(2) Prove igniter flame within 10 seconds of the energization of the igniter fuel valves; for a Class 3 special igniter, proof of igniter operation is not required.

(a) If proven, admit fuel to main burner. For an oil burner other than a return flow type, simultaneously shut off oil-recirculating flow.

(b) If not proven, initiate a master fuel trip.

(3) After a maximum of 10 seconds for gas and Nos. 2 and 4 oils or 15 seconds for Nos. 5 and 6 oils, shut off igniter.

(4) Prove main flame *(see 5.4.4.1.1.3 and 5.4.4.1.1.4)* and proceed as follows:

(a) If proven, release to modulating control where provided.

(b) If not proven, initiate a master fuel trip.

5.6.2.6.2.2 Class 2 Igniter.

The light-off cycle for a burner with a Class 2 igniter shall accomplish the following in the listed order:

(1)* Energize the ignition transformer and igniter fuel valves.

(2) Prove igniter flame within 10 seconds of the energization of the igniter fuel valves and proceed as follows:

(a) If proven, admit fuel to the main burner. For an oil burner other than a return flow type, simultaneously shut off the recirculating flow.

(b) If not proven, initiate a master fuel trip.

(3) After a maximum of 10 seconds for gas and Nos. 2 and 4 oils or 15 seconds for Nos. 5 and 6 oils, prove the main flame *(see 5.4.4.1.1.2)* and proceed as follows:

(a) If proven, release to combustion control for modulation, where provided.

(b) If not proven, initiate a master fuel trip.

5.6.2.6.2.3 Class 1 Igniter.

The light-off cycle for a burner with a Class 1 igniter shall accomplish the following in the listed order:

(1)* Energize the ignition transformer and igniter fuel valves.

(2) Prove igniter flame within 10 seconds of the energization of the igniter fuel valves and proceed as follows:

(a) If proven, admit fuel to the main burner. For an oil burner other than a return flow type, simultaneously shut off recirculating flow.

(b) If not proven, initiate a master fuel trip.

(3) After a maximum of 10 seconds for gas and Nos. 2 and 4 oils or 15 seconds for Nos. 5 and 6 oils, prove the main flame *(see 5.4.4.1.1.1)* and proceed as follows:

(a) If proven, release to combustion control for modulation, where provided.

(b) If not proven, initiate a master fuel trip.

5.6.2.6.3 Modulation.

Modulation, where provided, shall be accomplished by a combustion control system.

5.6.2.6.4 Shutdown.

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5.6.2.6.4.1 Normal Shutdown.

For ~~automatic (i.e., recycling)~~automatic recycling boilers, high steam pressure, high water temperature, or low water level (not determined by the auxiliary low water cutout) shall accomplish a normal shutdown, and the burner shall be allowed to recycle when steam pressure, water temperature, or water level has returned to within the preset operating range.

5.6.2.6.4.2 Normal Shutdown Cycle.

The normal shutdown cycle shall accomplish the following in the listed order:

(1) Shut off the fuel supply to the main burner.

(2) For oil, proceed as follows:

(a) For watertube boilers, if a Class 1 igniter is used, use the manufacturer's instructions to purge the main burner oil gun prior to continuing the normal shutdown.

(b) For firetube boilers, where the manufacturer’s instructions permit, purging the main burner oil gun in conjunction with the operation of its igniter is permitted.

(c) Where used, open the recirculating valve.

(d) Where used, shut off atomizing medium if required by operating procedures.

(3) Shut off the fuel supply to the igniter if in operation.

(4) Perform a postpurge of the furnace and boiler gas passes; the duration of the postpurge must be no less than 15 seconds at an airflow rate not exceeding that at which the unit was shut down.

(5) Shut down the fan if required by operating procedures.

5.6.2.6.4.3* Master Fuel Trip.

Any of the conditions in 5.6.2.6.4.3(A) or 5.6.2.6.4.3(B) shall initiate a master fuel trip, and the burner shall not be allowed to recycle until a trained operator determines the cause of the shutdown and takes the necessary corrective action to ensure that conditions are within specified operating limits prior to restarting.

(A)

Oil conditions shall include the following:

(1) Low fuel pressure

(2) Low temperature of heated oils

(3) Loss of combustion air supply

(4) Loss of or failure to establish flame

(5) Loss of control system actuating energy

(6) Power failure

(7) Low water level as determined by the auxiliary low water cutout

(8) Loss of atomizing medium, where used, as interlocked by flow or two pressure switches (one located at the service connection and the other at the burner, either one of which shall initiate a master fuel trip on low pressure)

(9) Excessive steam pressure or water temperature

(10) High temperature of heated oil

(B)

Gas conditions shall include the following:

(1) High gas pressure

(2) Low gas pressure

(3) Loss of combustion air supply

(4) Loss of or failure to establish flame

(5) Loss of control system actuating energy

(6) Power failure

(7) Low water level as determined by the auxiliary low water cutout

(8) Excessive steam pressure or water temperature

5.6.2.6.4.4 Master Fuel Trip Cycle.

The master fuel trip cycle shall accomplish the following in the listed order and shall activate an alarm:

(1) Shut off the fuel supply to the main burner.

(2) Shut off the fuel supply and interrupt spark to the igniter if in operation.

(3) For oil, proceed as follows:

(a) Where used, open the recirculating valve.

(b) Where used, shut off the atomizing medium if required by operating procedures.

(4) Where the inerting system is used, energize it simultaneously with 5.6.2.6.4.4(1).

(5) Perform a postpurge of the furnace and boiler gas passes. The duration of the postpurge must be no less than 15 seconds at an airflow rate not exceeding that at which the unit was shut down.

(6) After postpurge, shut down the fan if desired.

(7) Require manual reset.

5.6.3 Automatic Burner Management Systems — Nonrecycling ~~Systems~~ .

5.6.3.1

An automatic nonrecycling unit shall not be started from a cold condition unless a trained operator is present.

5.6.3.2

The provisions of ~~5.6.2.1~~ 5.6.2.2 , 5.6.2.3, ~~5.6.2.5~~ , and ~~5.6.2.6~~ 5.6.2.5 shall apply.

5.6.3.3

An automatic nonrecycling unit shall perform four major functions as given in 5.6.2.6.1 through 5.6.2.6.4.4 .

5.6.3.4

The provisions of 5.6.2.6.4.1 shall not apply.

5.6.3.5

When high steam pressure, high water temperature, or low water level establishes a normal shutdown, the burner shall not be allowed to recycle.

5.6.3.6

A trained operator shall initiate the restart.

5.6.4 Manual Supervised Burner Management Systems.

5.6.4.1

The provisions of 5.6.2 shall apply. The steps listed shall be taken by a trained operator when starting a manual supervised unit, and the required interlocks shall be satisfied at each step.

5.6.4.2

Fuel pressure and temperature, atomizing medium, control system energy, power, and water level shall have been established.

5.6.4.3

When interlocks have been satisfied, this fact shall be indicated to the operator.

5.6.4.4

A manual supervised unit shall perform the four major functions as given in 5.6.2.6.1 through 5.6.2.6.4.4 .

5.6.4.5

The three specific provisions of 5.6.2.1 , 5.6.2.6 , and 5.6.2.6.4.1 shall not apply.

5.6.4.6

When high steam pressure, high water temperature, or low water level establishes a normal shutdown, the burner shall not be allowed to recycle.

5.6.5 Soot Blowing.

Where soot blowers are used, the following shall apply:

(1) Soot blowing at nonoptimum air-fuel ratios has been known to lead to explosive formations of air-soot clouds within the boiler and shall be avoided.

(2) Soot blowers shall be operated only while burners are firing at rates such that the burner flame cannot be extinguished.

(3) Boilers that are equipped with automatic soot-blowing equipment shall have their controls interlocked to prevent operation when the burner is shut down or in the prefiring or light-off cycles.

Supplemental Information

File Name	Description	Approved
SR_713_5.6.docx	For staff use	✓

Submitter Information Verification

Submitter Full Name: Lisa Hartman
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 16 11:11:42 EST 2018

Committee Statement and Meeting Notes

Committee Statement: The committee reviewed the use of automatic (recycling) and automatic nonrecycling and revised section titles to agree with the terms defined in Chapter 3.

Cross references were corrected in 5.6.3 and 5.6.4 to clarify which requirements apply to each type of system.

Response Message:

Editorial Comment

Click here

Second Revision No. 714-NFPA 85-2018 [Section No. 5.8.1.2]

5.8.1.2

~~Class 1 or Class 2 i~~ I gniters shall be used during the fuel transfer as required by the manufacturer ~~or~~ and as established by test.

Submitter Information Verification

Submitter Full Name: Lisa Hartman
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 16 11:43:53 EST 2018

Committee Statement and Meeting Notes

Committee Statement: Language was modified for consistency with the change made in 5.7.1.2.
Response Message:

Second Revision No. 715-NFPA 85-2018 [Section No. 5.9.1.1]

5.9.1.1

~~Class 1 or Class 2 i~~ I gniters shall be used during the fuel transfer as required by the manufacturer ~~or~~ and as established by test.

Submitter Information Verification

Submitter Full Name: Lisa Hartman
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 16 11:47:51 EST 2018

Committee Statement and Meeting Notes

Committee Statement: Language modified for consistency with the change made in 5.7.1.2.
Response Message: