

(d) *Programming control.* The programming control must provide a programmed sequence of interlocks for the safe ignition and normal shutdown of the boiler burners. The programming control must prevent ignition if unsafe conditions exist and must include the following minimum sequence of events and interlocks:

(1) *Prepurge.* Boilers must undergo a continuous purge of the combustion chamber and convecting spaces to make sure of a minimum of 5 changes of air. The purge must not be less than 15 seconds in duration, and must occur immediately prior to the trial for ignition of the initial burner of a boiler. All registers and dampers must be open and an air flow of at least 25 percent of the full load volumetric air flow must be proven before the purge period commences. The prepurge must be complete before trial for ignition of the initial burner.

NOTE: A pre-purge is not required immediately after a complete post-purge.

(2) *Trial for ignition and ignition.* (i) Only one burner per boiler is to be in trial for ignition at any time.

(ii) Total boiler air flow during light off must be sufficient to prevent pocketing and explosive accumulations of combustible gases.

(iii) The burner igniter must be in position and proven energized before admission of fuel to the boiler. The igniter must remain energized until the burner flame is established and stable, or until the trial for ignition period ends.

(iv) The trial for ignition period must be as short as practical for the specific installation, but must not exceed 15 seconds.

(v) Failure of the burner to ignite during a trial for ignition must automatically actuate the burner safety trip controls.

(3) *Post-purge.* (i) Immediately after normal shutdown of the boiler, an automatic purge of the boiler equal to the volume and duration of the prepurge must occur.

(ii) Following boiler safety trip control operation, the air flow to the boiler must not automatically increase. Post purge in such cases must be under manual control.

(e) *Burner fuel oil valves.* Each burner must be provided with a valve that is—

(1) Automatically closed by the burner or boiler safety trip control system; and

(2) Operated by the programming control or combustion control subsystems, as applicable.

(f) *Master fuel oil valves.* Each boiler must be provided with a master fuel oil valve to stop fuel to the boiler automatically upon actuation by the boiler safety trip control system.

(g) *Valve closure time.* The valves described in paragraphs (e) and (f) of this section must close within 4 seconds of automatic detection of unsafe trip conditions.

(h) *Burner safety trip control system.*

(1) Each burner must be provided with at least one flame detector.

(2) The burner valve must automatically close when—

(i) Loss of burner flame occurs;

(ii) Actuated by the boiler safety trip control system;

(iii) The burner is not properly seated or in place; or

(iv) Trial for ignition fails, if a programming control is provided.

(i) *Boiler safety trip control system.* (1) Each boiler must be provided with a safety trip control system that automatically closes the master and all burner fuel oil valves upon—

(i) Boiler low-low water level;

(ii) Inadequate boiler air flow to support complete combustion;

(iii) Loss of boiler control power;

(iv) Manual safety trip operation; or

(v) Loss of flame at all burners.

(2) The low-low water level safety trip control must account for normal vessel motions and operating transients.

[CGD 81-030, 53 FR 17838, May 18, 1988, as amended by USCG-2002-13058, 67 FR 61278, Sept. 30, 2002]

§ 62.35-35 Internal combustion engine starting systems.

(a) The starting system for propulsion engines and ship service generator prime movers required to automatically start must meet sections 34.23.3, 34.37.2, and 34.39 of the American Bureau of Shipping's "Rules for Building and Classing Steel Vessels," except the sections referenced therein.