



"Eddy's Boilerhouse News"
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NEWS LETTER ASME CSD-1 Controls and Safety Devices for Automatically Fired Boilers – Series CSD-1, Letter 11.

CSD-1 Part CF-300 Gas-fired Boiler Units, Safety Controls

CF-310 Primary Safety Controls, states that, "each main burner assembly shall be provided with a primary safety control that will de-energize the main gas shutoff valves and shut off pilot fuel upon loss of flame". We will continue with the Flame Safeguard Control or Primary Safety Control discussion.

Now the question arises as to the response time of the Flame Safeguard Control. Once a flame signal is lost how much time is allowed for the Primary Safety Control to respond? The answer is four (4) seconds maximum. Most Primary Safety Controls will respond in approximately three (3) seconds. Therefore, when testing the flame detection system by removing the flame scanner, remember that the Primary Safety Control will not instantly shut off the gas or oil. Also keep in mind, that if the Flame Safeguard Control has post-purge, it will generally not go into alarm or lockout until the end of the complete cycle which includes post-purge. The control will not lockout and the alarm will light up or sound off (which ever) until after post purge. This seems to be a problem for some boiler inspectors. They want the alarm as soon as the fuel valves are closed.

Speaking of fuel valves, how long do they have to close once it has been de-energized? For gas fired boiler units with an input greater than 400,000 btu's but less than or equal to 2,500,000 btu's, the valve must shut off the gas within five (5) seconds maximum. The Primary Safety has 4 seconds to respond and the valve has up to five (5) seconds to close, it looks like a total of nine (9) (that is if my first grade teacher taught me addition correctly). It is rare to see a boiler require nine seconds to shut down.

Now for boiler units with an input greater than 2,500,000 btu's but less than 12,500,000 btu's, the Flame Safeguard Control has a maximum of four (4) seconds to respond and the gas valves must close within one (1) second. First grade math again, that is a total of five (5) seconds to shut down. Again, remember post-purge may take place before the control locks out and the alarm sounds.

Okay, Okay, for you guys firing on oil what is the response times? Oil-fired burners with inputs greater than three (3) gallons per hour and less than or equal to seven (7) gallons per hour with intermittent direct spark ignition (that means the spark stays on all the time the burner is firing), the flame failure response time is fifteen (15) seconds maximum. Oil-fired burners with inputs greater than seven (7) gallons per hour and less than or equal to twenty (20) gallons per hour with intermittent direct spark ignition, the flame response time is maximum four (4) seconds. For oil-fired burners with inputs greater than three (3) gallons per hour and less than twenty (20) gallons per hour with either an interrupted pilot or interrupted direct spark ignition (that means it goes off after the main flame is established), the flame response time is a maximum of four (4) seconds. The valve closing time for all of the above is five (5) seconds.

Oil-fired burners with inputs of greater than twenty (20) gallons, the flame failure response time is a maximum of four (4) seconds, with a valve closing time of one (1) second maximum.

This would have been easy if everything was the same. No such luck. Be Safe!

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