12. Boiler Features Explained

Multiple fuel source

This is a term applied to a boiler, which is designed to burn multiple types of fuels in its operation. A boiler operator would require an advanced endorsement when the operation relies on multiple fuel types that may be fired simultaneously. This does not include boilers that change fuel type during start sequence. A boiler that relies on multiple fuel types means a boiler that is fired using at least two of the following fuel types:

- gas
- liquid fuel, including oil and diesel fuel
- solid fuel, including coal (including pulverised coal), briquettes, coke, wood (including wood chips) or any other type of solid fuel.

Pre-heaters

The purpose of a preheater is to recover lost heat from the boiler flue gas which increases the thermal efficiency of the boiler by reducing the useful heat lost in the flue gas. As a consequence, the flue gases are also conveyed to the flue gas stack (or chimney) at a lower temperature, allowing simplified design of the conveyance system and the flue gas stack. It also allows control over the temperature of gases leaving the stack to meet emissions requirement. Pre-heaters have not been defined but have generally been considered as large plant with air pre-heaters only, as opposed to small plant with feedwater heaters as many small plants will have simple feedwater pre-heaters. Pre-heaters should be limited to air and steam re-heaters for multi stage steam heating arrangements but exclude feedwater pre-heaters.

Superheater

A superheater is a device used to convert saturated steam or wet steam into dry steam used in steam engines or in processes, such as steam reforming. There are three types of superheaters namely: radiant, convection, and separately fired. A superheater can vary in size from a few metres or some hundred metres. In a steam engine, the superheater re-heats the steam generated by the boiler, increasing its thermal energy and decreasing the likelihood that it will condense inside the engine. Steam which has been superheated is logically known as superheated steam; non-superheated steam is called saturated steam or wet steam. Superheaters were applied to steam locomotives in quantity from the early 20th century, to most steam vehicles, and to stationary steam engines.

Economiser

In boilers, economisers are basically heat exchange devices that heat fluids, usually water, up to but not normally beyond the boiling point of that fluid. Economisers are so named because they can make use of the heat energy in fluid streams that are hot, but not hot enough to be used in a boiler, thereby recovering more useful heat energy and improving the boiler's efficiency.