

Boilers and Unfired Pressure Vessels

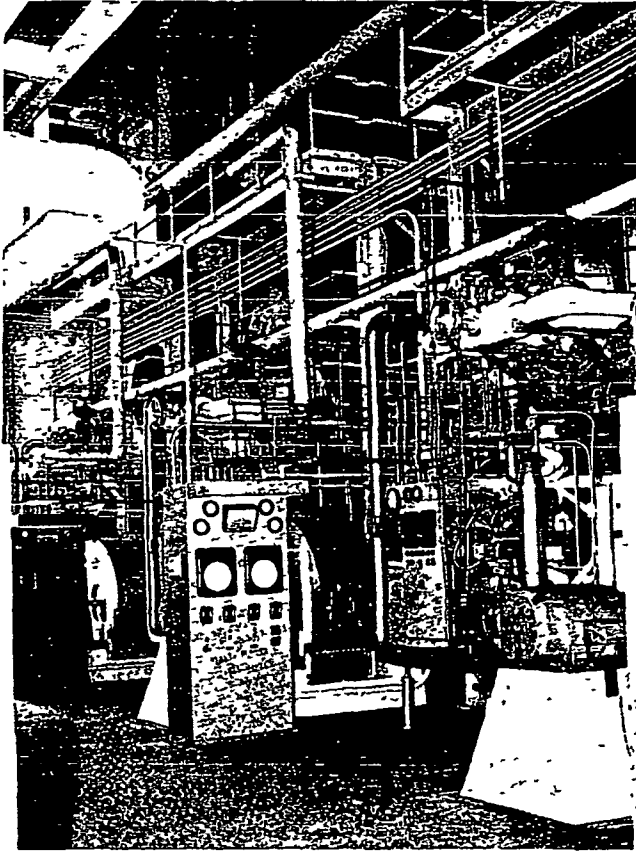


FIG 18-4 —The meter and control board of a boiler should be located on the operating floor, in a place where the operator can also watch the boiler fire and the water column

Courtesy National Engineer Magazine

Superheaters After the heat transfer medium (water, steam, or other material) leaves the boiler unit itself, it can have its temperature raised even more by passing through a superheater. Superheaters must be made to withstand high temperatures and be equipped with safety valves, as specified in the ASME Code. They should be designed so as to give as little reduction as possible in the pressure of the heat transfer medium. Stop valves and connecting pipe should be lagged to increase efficiency and to keep personnel from coming into direct contact with the hot surfaces.

Superheater drains should be left open until a full flow of steam is circulating through the superheater tubes. Manufacturer's operating instructions must be rigidly adhered to, especially when starting up or shutting down the unit. Cutting in too soon may

cause the tubes to fail, which will not only wreck the equipment but can cause injury to operating personnel.

Detailed operation procedures are given in Section VII of the ASME Code.

Air preheaters The two types of combustion air preheaters are regenerative and recuperative. The regenerative type employs a set of moving grids, which revolve like spokes of a slow-moving wheel at approximately 4 rpm. The recuperative type has no moving parts, air flows past the tubes. In both types the air flows outside the tubes while flue gas flows inside.

Fires may occur in an air preheater immediately after lighting a boiler and during periods of low-load operation. This condition can be detected by a sudden rise in air heater temperature.