

## Safety and Relief Valves

The ASME Code requires that the deaerator vessel be protected from pressurization beyond its maximum allowable (stamped) pressure by the provision of safety valves. The required total safety valve capacity in the system shall be determined by the parties responsible for design of the water and steam supply systems connected to the deaerator. In most cases, this will not be the deaerator manufacturer. Items to be considered are:

- Fail open capacity of steam pressure reducing valve(s) supplying steam to the deaerator or wide open capacity of any manually operated steam control bypass valves.
- Flash steam produced by high pressure drains/condensate returns

In the case of a deaerator, the principle source of overpressure does not originate within the unit and therefore the total required safety valve capacity need not be installed on the deaerator vessel itself. However, the deaerator may be provided with a relief valve capable of passing a limited amount of steam to provide a warning that the deaerator is receiving excessive energy input prior to full operation of the system's safety valves. Safety valves providing full capacity to meet ASME Code rules shall be installed in the steam piping upstream of the deaerator but downstream of any stop or regulating valves. The size and quantity of these additional safety valve(s) shall be determined by the party responsible for specifying the steam pressure controls for the deaerator.

As a caution to the User, operation ('popping') of the safety valves at 100% of installed capacity can cause rapid depressurization of the system with risk of damage to the deaerator internals and disruption of the boiler feedwater flow. The use of 'pressure relief' or 'backpressure control' type valves in conjunction with the steam pressure control and safety valves provides a measure of protection against rapid depressurization due to full lift of the safety valves.