3/4.7   PLANT SYSTEMS

BASES

3/4.7.1   TURBINE CYCLE

3/4.7.1.1   SAFETY VALVES

The OPERABILITY of the main steam line code safety valves ensure that the secondary system pressure will be limited to within 110% of the system design pressure, during the most severe anticipated system operational transient. The maximum relieving capacity is associated with a turbine trip from 100% RATED THERMAL POWER coincident with an assumed loss of condenser heat sink (i.e., no steam bypass to the condenser).

The specified valve lift settings and relieving capacities are in accordance with the requirements of Section III of the ASME Boiler and Pressure Code, 1968 Edition with Addenda through Winter, 1970. The total relieving capacity for all safety valves on all of the steam lines is 12.83×10^6 lbs/hr which is greater than the total secondary steam flow of 12.77×10^6 lbs/hr at 100% RATED THERMAL POWER. A minimum of 2 OPERABLE safety valves per steam generator ensures that sufficient relieving capacity is available for the allowable THERMAL POWER restriction in Table 3.7-1.

STARTUP and/or POWER OPERATION is allowable with safety valves inoperable within the limitations of the ACTION requirements on the basis of the reduction in secondary system steam flow and THERMAL POWER required by the reduced reactor trip settings of the Power Range Neutron Flux channels. The reactor trip setpoint reductions are derived from the following conservative calculation such that the maximum power level allowed for operation with inoperable MSSVs is below the heat removing capability of the operable MSSVs.

In order to calculate these setpoints, the governing equation is the relationship: $q = m\Delta h$, where q is the heat input from the primary side, m is the steam flow rate, and Δh is the heat of the vaporization at the steam relief pressure. Therefore, the equation used in defining the revised setpoint values is:

$$\text{Hi } \Phi = \frac{100}{Q} \times \frac{(w_g \cdot h_{fg} \cdot N)}{K}$$

3/4.7 PLANT SYSTEMS

BASES

3/4.7.1 TURBINE CYCLE

3/4.7.1.1 SAFETY VALVES

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