

ATTACHMENT A

BASES

3/4.7.1 TURBINE CYCLE

3/4.7.1.1 SAFETY VALVES

The OPERABILITY of the main steam line Code safety valves ensures that the Secondary Coolant System pressure will be limited to within 110% (1320 psia) of its design pressure of 1200 psia during the most severe anticipated system operational transient. The maximum relieving capacity is associated with a turbine trip from 102% RATED THERMAL POWER coincident with an assumed loss of condenser heat sink (i.e., no steam dumps to the condenser).

Insert B
The specified valve lift settings and relieving capacities are in accordance with the requirements of Section III of the ASME Boiler and Pressure Code, 1971 Edition. The total relieving capacity for all valves on all of the steam lines is 17.958×10^6 lbs/h which is 119% of the total secondary steam flow of 15.135×10^6 lbs/h at 100% RATED THERMAL POWER. A minimum of two 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 Coolant 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 on the following bases:

For four loop operation:

$$SP = \frac{(X) - (Y)(V)}{X} \times (109).$$

Where:

SP = Reduced Reactor Trip Setpoint in percent of RATED THERMAL POWER,

V = Maximum number of inoperable safety valves per steam line,

PLANT SYSTEMS

BASES

SAFETY VALVES (Continued)

- 109 = Power Range Neutron Flux-High Trip Setpoint for four loop operation,
- X = Total relieving capacity of all safety valves per steam line in lbs/hour, and
- Y = Maximum relieving capacity of any one safety valve in lbs/hour.

3/4.7.1.2 AUXILIARY FEEDWATER SYSTEM

The OPERABILITY of the Auxiliary Feedwater System ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss-of-offsite power.

The motor-driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 740 gpm at a pressure of 1450 psig to the entrance of the steam generators. The diesel-driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 740 gpm at a pressure of 1450 psig to the entrance of the steam generators. This capacity is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F when the RHR System may be placed into operation.

3/4.7.1.3 CONDENSATE STORAGE TANK

The OPERABILITY of the condensate storage tank with the minimum water level of 40% ensures that sufficient water (200,000 gallons) is available to maintain the RCS at HOT STANDBY conditions for 9 hours with steam discharge to the atmosphere concurrent with total loss-of-offsite power. The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics.

3/4.7.1.4 SPECIFIC ACTIVITY

The limitations on Secondary Coolant System specific activity ensure that the resultant offsite radiation dose will be limited to a small fraction of 10 CFR Part 100 dose guideline values in the event of a steam line break. This dose also includes the effects of a coincident 1 gpm reactor to secondary tube leak in the steam generator of the affected steam line. These values are consistent with the assumptions used in the safety analyses.

INSERT B

The requirement that the main steam line Code safety valves be set to within $\pm 1\%$ of the appropriate setpoint is consistent with Section III of the ASME Boiler and Pressure Vessel Code. The allowed operating tolerance of $\pm 3\%$ is supported by the Commonwealth Edison Company, Byron/Braidwood Unit 1 & 2 Overpressure Protection Report.

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$$High\Phi = \frac{100}{Q} \left(\frac{w_s h_{fg} N}{K} \right)$$

Where:

- | | | |
|-----------------|---|--|
| High Φ | = | Safety Analysis power range high neutron flux setpoint, in percent. |
| Q | = | Nominal NSSS power rating of the plant (including reactor coolant pump heat), in Mw (= 3427.6 Mw). |
| K | = | Conversion factor = 947.82 (BTU/sec.)/Mw. |
| w _s | = | minimum total steam flow rate capability of the operable MSSVs on any one steam generator at the highest MSSV opening pressure including tolerance and accumulation, as appropriate, in lbm/sec. |
| h _{fg} | = | Heat of vaporization for steam at the highest MSSV opening pressure including tolerance and accumulation, as appropriate, in BTU/lbm. |
| N | = | Number of loops in the plant (= 4). |

The values calculated from this algorithm were adjusted lower for use in Technical Specification 3.7.1.1 to account for instrument and channel uncertainties (9% power).

ATTACHMENT B

3/4.7 PLANT SYSTEMS

BASES

3/4.7.1 TURBINE CYCLE

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