Attachment 1

Proposed Changes

TABLE 3.7-1

MAXIMUM ALLOWABLE POWER RANGE NEUTRON FLUX HIGH SETPOINT WITH INOPERABLE STEAM LINE SAFETY VALVES DURING FOUR LOOP OPERATION

Maximum Number of Inoperable Safety Valves on Any Operating Steam Generator	Maximum Allowable Power Range Neutron Flux High Setpoint (Percent of RATED THERMAL POWER)
1	~~87~~ 84
2	~~65~~ 60
3	~~43~~ 35

TABLE 3.7-2

MAXIMUM ALLOWABLE POWER RANGE NEUTRON FLUX HIGH SETPOINT WITH INOPERABLE STEAM LINE SAFETY VALVES DURING THREE LOOP OPERATION

Maximum Number of Inoperable Safety Valves on Any Operating Steam Generator*	Maximum Allowable Power Range Neutron Flux High Setpoint (Percent of RATED THERMAL POWER)
1	(**)
2	(**)
3	(**)

*At least two safety valves shall be OPERABLE on the non-operating steam generator.

**These values left blank pending NRC approval of three loop operation.

Attachment 2

Justification/Safety Analysis

JUSTIFICATION:

The operability of the main steam line code safety valves ensures that the Secondary Coolant System pressure will be limited to less than 110% of its design pressure of 1185 psig 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).

LCO 3.7.1.1 statement requires, in part, that, "With four reactor coolant loops and associated steam generators in operation and with one or more main steam line code safety valves inoperable, operation in MODES 1, 2, and 3 may proceed provided, that within 4 hours, either the inoperable valve is restored to OPERABLE status or the Power Range Neutron Flux High Trip Setpoint is reduced per Table 3.7-1 ..."

The reduced trip setpoints in Table 3.7-1 are derived from the following formula:

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

Where:

SP = Reduced Reactor Trip Setpoint in percent of Rated Thermal Power,
X = Total relieving capacity of all safety valves per steam line in lbs/hour,
Y = Maximum relieving capacity of any one safety valve in lbs/hour,
V = Maximum number of inoperable safety valves per steam line , and
109 = Power Range Neutron Flux High Trip Setpoint for four loop operation.

The current reduced trip setpoints can be derived assuming that the valves are of the same size and relieving capacity. As such:

$$Y = \frac{X}{5}$$

$$\text{and } SP = \frac{X - (X/5)(V)}{X} \times 109 = [1 - (V/5)] \times 109$$

Therefore: V = 1, SP = 87%
V = 2, SP = 65%
V = 3, SP = 43%

During the Design Basis Document development process, it was identified that McGuire's main steam safety valves were certified to different ASME relieving capacities.

ASME Certified Capacities for valves at the respective setpoint:

Set Pressure (psig)	Size	Certified Mass Flow rate (#/hr)
1170	6Q8	671,083
1190	6Q8	682,416
1205	6R10	908,050
1220	6R10	919,220
1225	6R10	922,950

For conservatism, the largest mass flow rate (maximum lost capacity per valve) is used for Y. Using the same formula as before, the new reduced trip setpoints are calculated as follows:

X = Sum (Certified Mass Flow Rates)
= (671,083 + 682,416 + 908,050 + 919,220 + 922,950) #/hr
= 4,103,719 #/hr
Y = 922,950 #/hr (6R10 at 1225 psig)

For 1 inoperable safety valve on any operating steam generator:

SP = [(X)-(Y)(V)](109)/(X)
SP = [(4,103,719)-(1)(922,950)](109)/(4,103,719)
= 84.48
SP = 84 (Percent of Rated Thermal Power)

For 2 inoperable safety valves on any operating steam generator:

SP = [(X)-(Y)(V)](109)/(X)
SP = [(4,103,719)-(2)(922,950)](109)/(4,103,719)
= 59.97
SP = 60 (Percent of Rated Thermal Power)

For 3 inoperable safety valves on any operating steam generator:

SP = [(X)-(Y)(V)](109)/(X)
SP = [(4,103.719)-(3)(922,950](109)/(4,103,719)
= 35.45
SP = 35 (Percent of Rated Thermal Power)

In summary, trip setpoint reductions determined in this manner are more accurate and conservative because the actual relieving capacities are taken into account.

SAFETY EVALUATION:

The function of the reduced reactor trip allowable values listed in Table 3.7-1 is to enforce a reduction in core operating power level when MSSVs are inoperable. Reduction in power would be necessary to prevent the S/G from reaching 110% of its design pressure.

Since the safety valves' capacities and lift setpoints were not affected by this change, the overpressure protection for S/G's when safety valves are inoperable is still ensured provided that a reduction in power is made. The new reduction limits are more conservative.

The new reduction limits put the reactor in a more conservative power level of operation, in the event of inoperable MSSVs, to ensure secondary overpressure protection. Primary overpressure protection is not affected.

The requirements of Section III of ASME Boiler and Pressure Vessel Code for pressure relieving devices are not affected sin the existing MSSV relief capacities are adequate and unchanged this proposed change.

This proposed change does not involve any hardware modification, and does not involve any change in the lift setpoints of the safety valves previously analyzed by Engineering Division.

Based on the above facts, it is concluded that the margin of safety will not be reduced by this change.

Attachment 3

Significant Hazards Considerations

This proposed change shall be deemed not to involve a significant hazards consideration if there is no positive finding in any of the following areas:

1. Will operation of the facility in accordance with this proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

RESPONSE: No.

The MSSVs do not contribute to the initiation of any accident. Though improper operation and malfunction of MSSVs are considered in FSAR analyses as part of accident scenarios, no change in the operation or function of the MSSVs is affected by this proposed change. ASME Code requirements for MSSV setpoint, relief capacity and operability are maintained. The high flux trip setpoint does not contribute to the initiation of any accident.

2. Will operation of the facility in accordance with this proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

RESPONSE: No.

The proposed change does not create the possibility for a new or different kind of accident than previously evaluated because the function of the MSSVs or the RPS high flux trip is not affected. The new reduction limits put the reactor in a more conservative level of operation when MSSVs are inoperable.

3. Will operation of the facility in accordance with this proposed change involve a significant reduction in a margin of safety?

RESPONSE: No.

This proposed change will maintain the reactor in a more conservative operating power level when safety valves are inoperable.

Based on the above, it is concluded that: (1) the proposed change does not constitute a significant hazards consideration as defined by 10 CFR 50.92; (2) there is a reasonable assurance that the health and safety of the public will not be endangered by the proposed change; and (3) this action will not result in a condition which significantly alters the impact of the station on the environment as described in the NRC Final Environmental Statement.