ATTACHMENT 1

Proposed Technical Specification Change

Surry Power Station

Units 1 and 2

b. Three valves shall be operable when the reactor coolant average temperature is greater than 350°F, the reactor is critical, or the Reactor Coolant System is not connected to the Residual Heat Removal System.

c. As-found valve lift settings shall be at 2485 psig ± 3 percent.* The valve lift setting shall be returned from their as-found condition to an as-left setting of 2485 psig ± 1 percent.

4. Reactor Coolant Loops

Loop stop valves shall not be closed in more than one loop unless the Reactor Coolant System is connected to the Residual Heat Removal System and the Residual Heat Removal System is operable.

5. Pressurizer

a. The reactor shall be maintained subcritical by at least 1% until the steam bubble is established and the necessary sprays and at least 125 KW of heaters are operable.

b. With the pressurizer inoperable due to inoperable pressurizer heaters, restore the inoperable heaters within 72 hours or be in at least hot shutdown within 6 hours and the reactor coolant system temperature and pressure less than 350°F and 450 psig, respectively, within the following 12 hours.

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* The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.

ATTACHMENT 2

Safety Evaluation

Surry Power Station

Units 1 and 2

SAFETY EVALUATION

INTRODUCTION

A safety evaluation has been performed which justifies increasing the current Technical Specification pressurizer safety valve (PSV) lift setpoint tolerance from 1% as-found and 1% as-left to 3% as-found and 1% as-left. This change is being made in order to quantify inherent safety margin in the current lift setpoint tolerance and to provide greater operational flexibility in meeting periodic test requirements established by safety analysis.

The proposed Technical Specification change is described in the following section. A discussion of the analyses and evaluations performed in support of this change is then presented.

PROPOSED TECHNICAL SPECIFICATION CHANGES

This safety evaluation provides the justification for increasing the PSV lift setpoint tolerance requirement established by Technical Specification 3.1.A.3.c. This is the only Technical Specification affected by the proposed PSV lift setpoint tolerance increase.

DISCUSSION AND EVALUATION

Surry Technical Specification 3.1.A.3.c indicates the currently applicable 1% as-found and as-left lift setpoint tolerance for the pressurizer safety valves. The analyses and evaluations described herein support a PSV setpoint tolerance increase to 3% as-found and 1% as-left.

The proposed setpoint tolerance increase does not change the nominal setpoint of the pressurizer safety valves. Only the allowable tolerance about the existing setpoint is to be changed.

An increase in the pressurizer safety valve lift setpoint tolerance affects the maximum pressure that may be attained in a system transient. Evaluation of the overall effect of changing the PSV setpoint tolerance was accomplished by examining the effect of the changes on those transients which experience significant pressure increases. These transients are the Loss of Load, the Locked Rotor, the Main Feedline Break, and the Loss of Normal Feedwater transients. The Loss of Load and the Locked Rotor transients have been determined to be the limiting overpressure events.

In the analyses described herein, the PSV's were assumed to begin to open at their lift setpoint plus 3% tolerance. The flow through the valves was modelled as varying linearly with pressure between zero lbm/sec (at the lift setpoint plus tolerance) and the rated flow (at the lift

setpoint plus 3% tolerance plus 3% accumulation). Because it is highly unlikely that all the safety valve setpoints at any given time will be at the extreme end of the tolerance band, and because real safety valves will be nearly full-open at the lift setpoint, the modelling of safety valve operation assumed in the analyses described herein is very conservative.

Because an increased low end tolerance potentially reduces the system pressure experienced at the point of minimum departure from nucleate boiling ratio (DNBR), the effect of an increased PSV setpoint tolerance on the DNBR results of affected transients was evaluated. The proposed changes were also evaluated in light of their impact on operational margins.

Transient analyses were performed with the RETRAN system transient analysis code (1).

LOSS OF LOAD EVENT ANALYSIS

The Loss of Load event is characterized by a rapid reduction in steam flow from the steam generator and a resultant rapid rise in secondary pressures. Consequently, primary side temperatures and pressures increase. The transient is terminated either by a direct reactor trip or in the limiting case by the high pressurizer pressure trip. The transient has been shown to not be limiting with respect to core thermal margins.

The Loss of Load analysis was performed to establish that a Loss of Load event would not result in primary side pressures beyond the limit of 2750 psia nor secondary side pressures beyond the limit of 1210 psia when the pressurizer safety valve lift setpoint tolerance is increased to 3%. The following assumptions were made in this analysis:

1. The loss of load is a 100% loss of load with no condenser dumps or power operated relief valves available.
2. The transient is initiated from 102% power.
3. Main feedwater is ramped to zero at the loss of load.
4. Pressurizer sprays are turned off.
5. A most negative Doppler power coefficient is assumed.
6. A most positive moderator temperature coefficient is assumed.
7. No credit is taken for a direct reactor trip on turbine trip.
8. No credit is taken for automatic rod control.
9. An increased setpoint tolerance is modelled by increasing the assumed nominal safety valve lift setpoint in the RETRAN single loop model.

The maximum primary side (cold leg) pressure was determined to be 2694 psia, which is well below the overpressure safety limit (110% of design pressure) of 2750 psia. The maximum secondary side (steam generator) pressure was determined to be 1179 psia, which is well below the overpressure safety limit of 1210 psia.

Graphs of the primary and secondary side pressure transients may be seen in Figures 1 and 2.

LOCKED ROTOR EVENT ANALYSIS

This analysis was performed in order to determine if an increased PSV lift setpoint tolerance would result in an overpressurization of either the primary or secondary side during a postulated Locked Rotor transient.

The following assumptions were used in this analysis:

1. Initial reactor power is 102% of nominal.
2. Initial average core temperature is nominal T(avg) + 4 F.
3. Initial Pressurizer Pressure is 2280 psia, nominal pressure + 30 psi.
4. Pressurizer sprays do not function.
5. Pressurizer power operated relief valves do not function.
6. Condenser steam dump valves never open.
7. Atmospheric steam dump valves never open.
8. Locked rotor is the initiating event at t=0.001 sec.
9. Reactor trip occurs on low RCS flow.

10. Coolant flow is divided into 50% through the core and 50% bypass.

11. Most Negative Doppler Power Coefficient

12. Most Positive Moderator Temperature Coefficient

13. Maximum value of delayed neutron fraction

14. Minimum trip reactivity

The RETRAN transient analysis of the Locked Rotor event with a 3% PSV setpoint tolerance rendered a peak primary (cold leg) pressure of 2667 psia and a peak secondary (steam generator) pressure of 1166 psia. These values are below the primary and secondary pressure safety limits of 2750 psia and 1210 psia, respectively.

Graphs of the primary and secondary side pressure transients may be seen in Figures 3 and 4.

LOSS OF NORMAL FEEDWATER

The key safety considerations for the Loss of Normal Feedwater transient are (a) the maintenance of a steam space in the pressurizer and (b) the insurance that the long-term water volume in the pressurizer is decreasing. An increase in the PSV setpoint tolerance could potentially affect the primary side pressure attained in a Loss of Normal Feedwater transient. However, the proposed setpoint tolerance change has no impact on primary side pressure since the maximum primary pressure attained in this transient is not high enough to challenge the pressurizer safety valve lift setpoint. Even if the Loss of Normal Feedwater event resulted in pressures which challenged the pressurizer safety valve setpoint, the

impact on thermal/hydraulic conditions in the RCS would be only to raise or lower primary side pressures by approximately 0.02*2500 psia = 50 psia. Such changes would not significantly impact the steam space or the long-term water volume results of the Loss of Normal Feedwater event analysis.

Because the increased PSV lift setpoint would not affect the thermal/hydraulic conditions in the RCS during this transient, there is no impact on the results of the current Loss of Normal Feedwater analysis.

MAIN FEEDLINE BREAK

The Main Feedline Break (MFLB) event is not formally analyzed as part of the Surry UFSAR. However, because of the possibility of extensive water discharge from the safety and relief valves following a MFLB, the NRC requested that Virginia Power define the flow parameters which describe the fluid conditions at the safety and relief valve inlets. Because an increased pressurizer safety valve setpoint tolerance could affect the fluid T/H conditions at the valve inlets, the impact of this change on the MFLB transient was evaluated.

It was concluded that the only effect of an increased pressurizer safety valve lift setpoint tolerance on this transient was to raise primary transient pressures and temperatures slightly. The changes in the overall system response to these slight increases in pressure and temperature are negligible. The valve test results presented in Reference (2) remain valid.

DNB CONSIDERATIONS

Because an increased low end tolerance potentially reduces the system pressure experienced at the point of minimum DNBR, the effect of 3% MSSV and PSV setpoint tolerances on the departure from nucleate boiling ratio (DNBR) results of affected transients was evaluated by examining the Surry UFSAR Chapter 14 safety analysis results.

Of the affected transients, only the DNBR results of the Locked Rotor event are potentially adversely affected by the increased low end tolerance. An examination of the currently applicable Locked Rotor analysis indicated that DNB analysis had been performed with a pressure of 2332 psia. This pressure is well below the proposed low end setpoint (2500 - 75 = 2425 psia, which is the nominal setpoint minus tolerance). Therefore, the setpoint tolerance increase presents no concerns regarding the DNBR results of the Locked Rotor transient.

OPERATIONAL MARGIN

The proposed setpoint tolerances have been chosen such that an inadvertent opening of the safety valves during normal operation will not occur. To illustrate, the nominal high primary pressure trip setpoint is 2400 psia with an uncertainty of 16 psi. The nominal setpoint plus uncertainty is, therefore, 2416 psia. Because the nominal PSV lift setpoint minus 3% tolerance is 2425 psia, a reactor trip would occur before an inadvertent opening of the PSV's would occur.

It may be concluded that the proposed setpoint tolerance change does not present any operational considerations.

CONCLUSIONS

In support of an increased pressurizer safety valve lift setpoint tolerance, the limiting overpressure events for Surry were reanalyzed. It was determined that with the pressurizer safety valve setpoint tolerance at 3%, the maximum primary and secondary pressures attained in the limiting overpressure transients (Loss of Load and Locked Rotor) remained below the overpressure safety limits (110% of the primary and secondary design pressures). The results of UFSAR Chapter 14 Transients other than the limiting overpressure transients are not invalidated by the proposed Technical Specifications change. The setpoint tolerance increase does not adversely impact the DNBR results of any transient for which DNB is a consideration. The setpoint tolerance increase does not adversely impact operational margins. In summary, pertinent safety parameters were evaluated for an increased safety valve setpoint tolerance and were found to remain within acceptable limits.

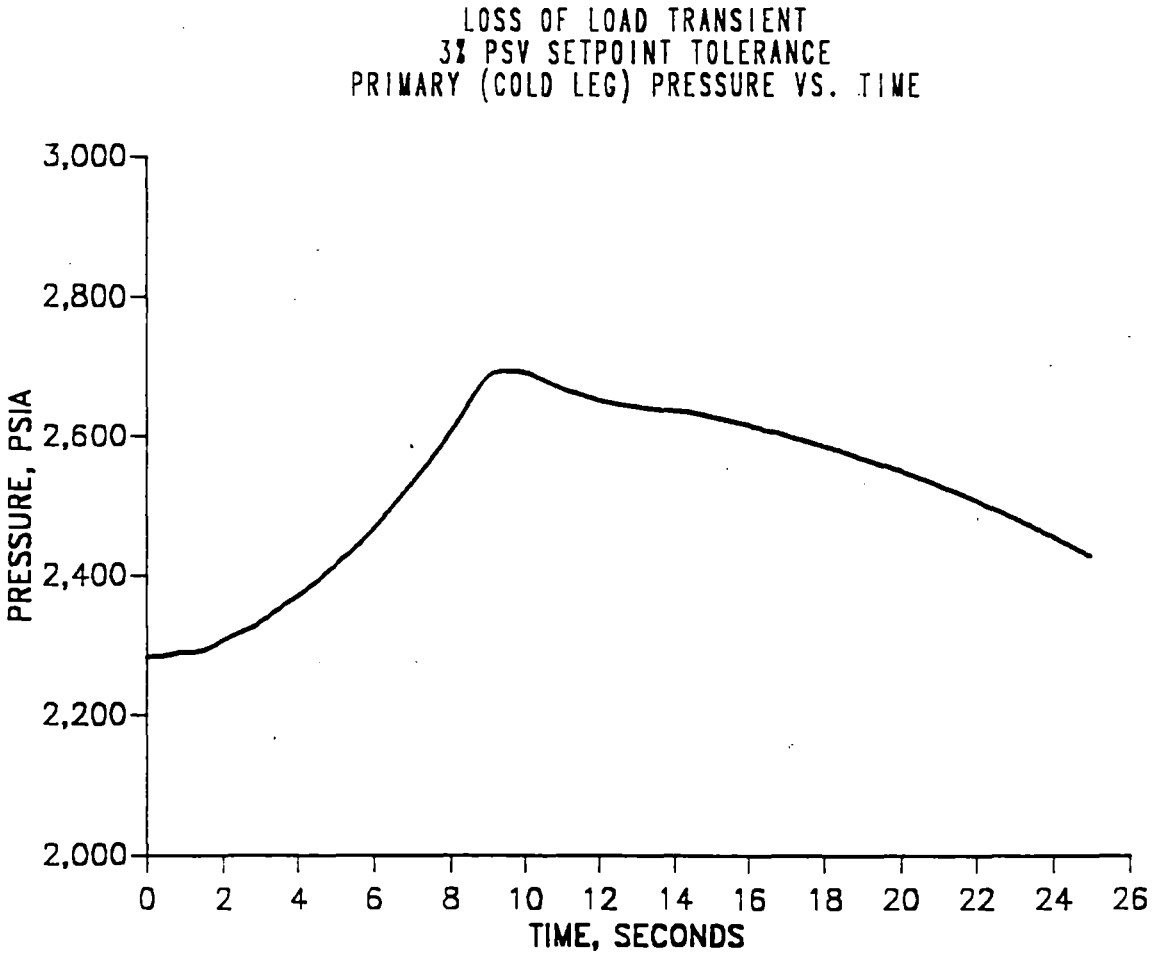
LOSS OF LOAD TRANSIENT
3% PSV SETPOINT TOLERANCE
PRIMARY (COLD LEG) PRESSURE VS. TIME
PRESSURE, PSIA
3,000
2,800
2,600
2,400
2,200
2,000
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME, SECONDS

Figure 1

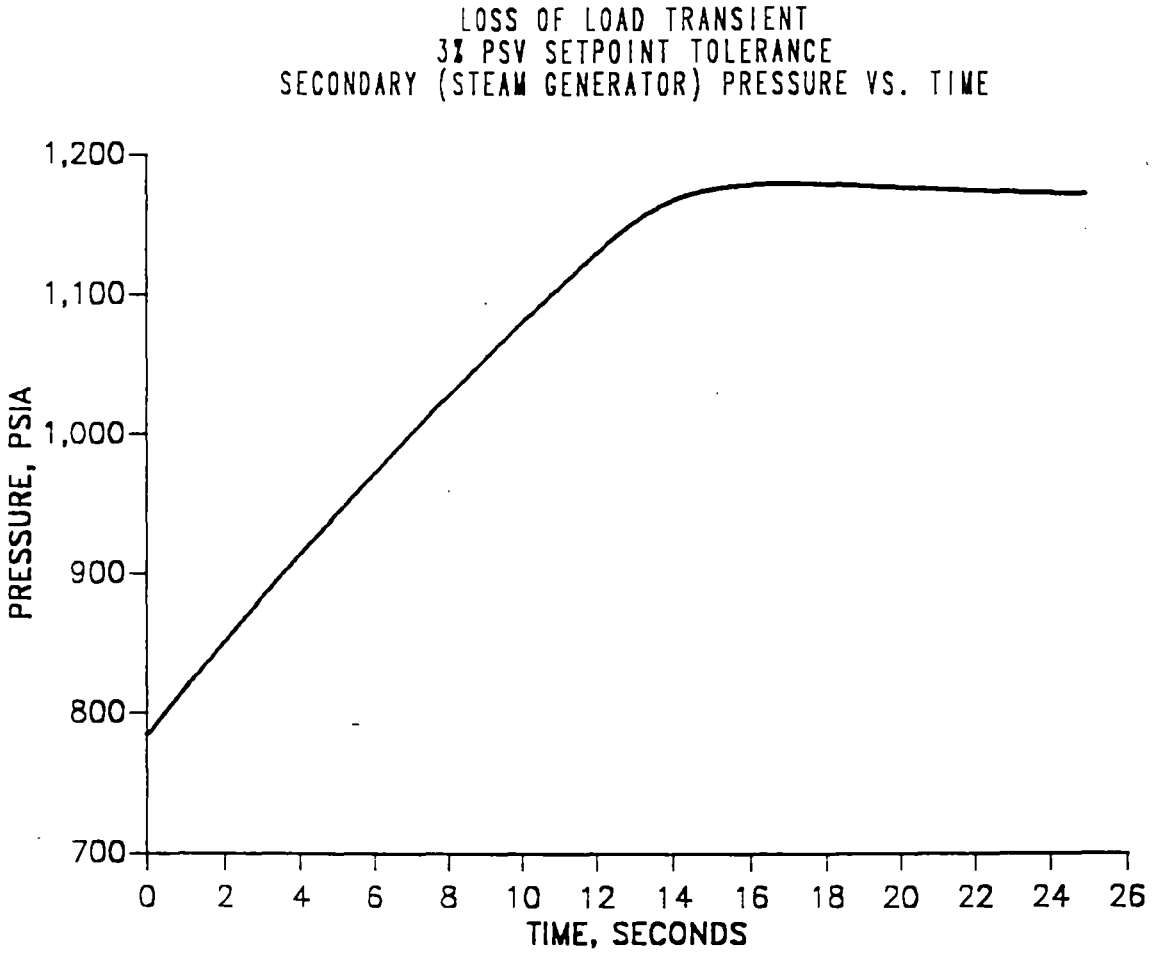
LOSS OF LOAD TRANSIENT
3% PSV SETPOINT TOLERANCE
SECONDARY (STEAM GENERATOR) PRESSURE VS. TIME
PRESSURE, PSIA
1,200
1,100
1,000
900
800
700
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME, SECONDS

Figure 2

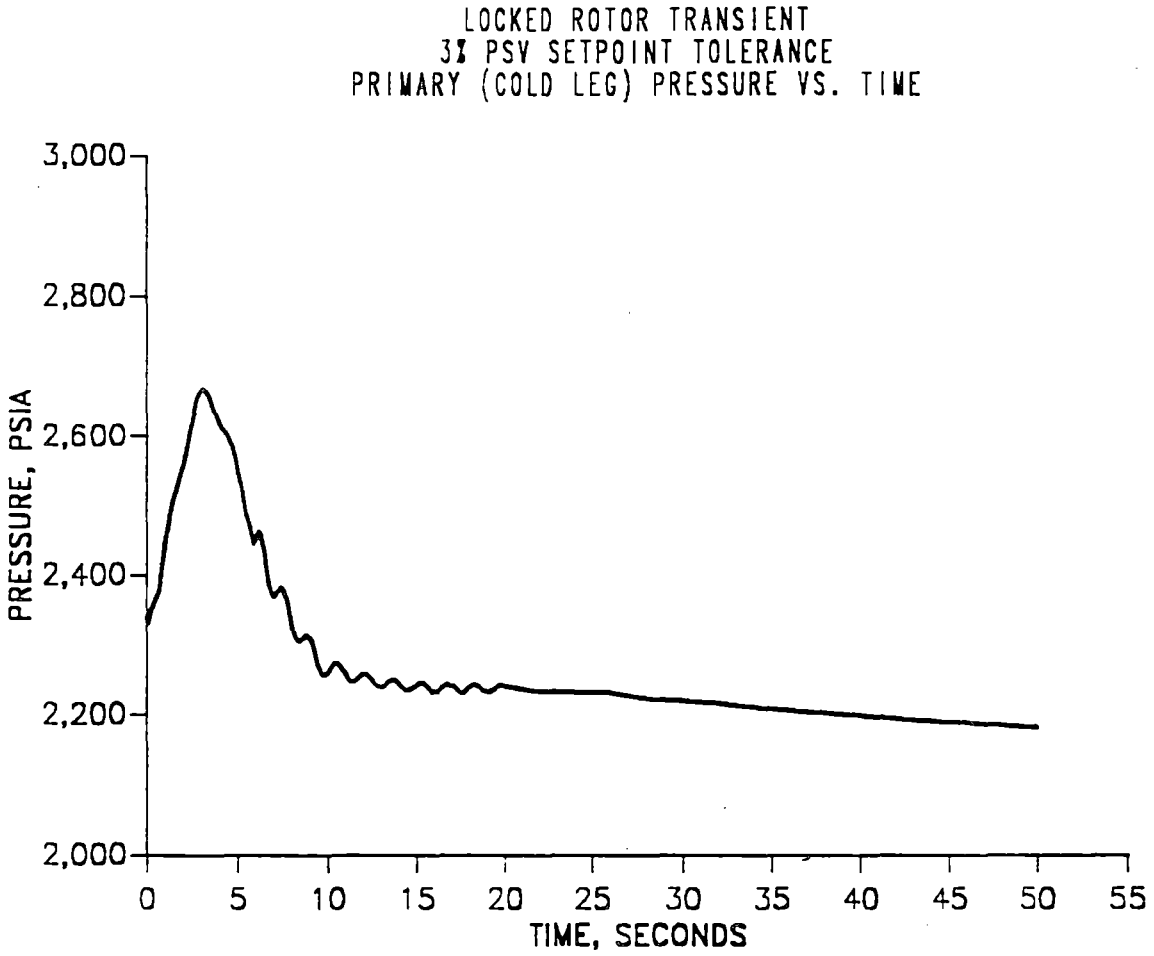
LOCKED ROTOR TRANSIENT
3% PSV SETPOINT TOLERANCE
PRIMARY (COLD LEG) PRESSURE VS. TIME
PRESSURE, PSIA
3,000
2,800
2,600
2,400
2,200
2,000
0
5
10
15
20
25
30
35
40
45
50
55
TIME, SECONDS

Figure 3

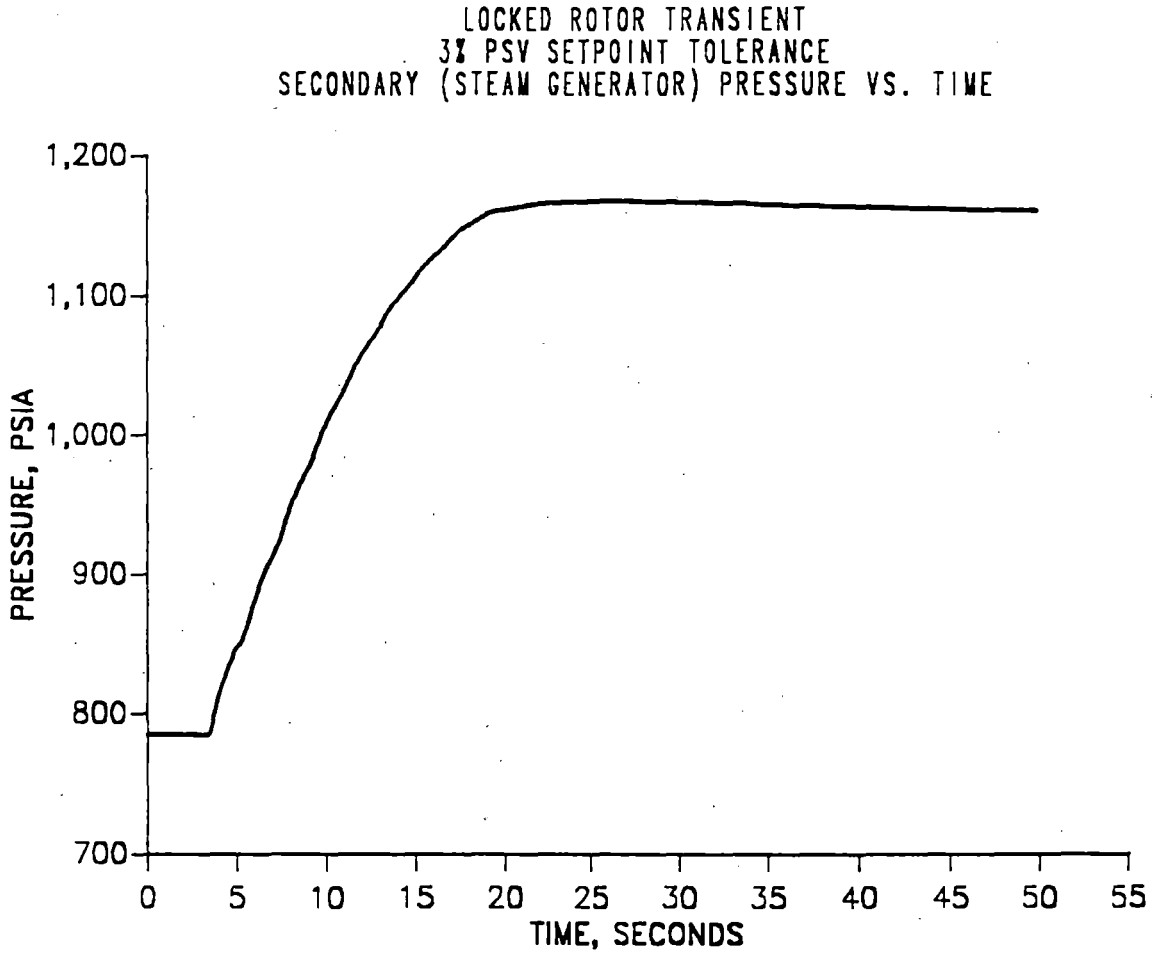
LOCKED ROTOR TRANSIENT
3% PSV SETPOINT TOLERANCE
SECONDARY (STEAM GENERATOR) PRESSURE VS. TIME
PRESSURE, PSIA
1,200
1,100
1,000
900
800
700
0
5
10
15
20
25
30
35
40
45
50
55
TIME, SECONDS

Figure 4

REFERENCES

(1) N. A. Smith: "VEPCO Reactor System Transient Analysis using the RETRAN Computer Code," VEP-FRD1-41A (May, 1985).

(2) Letter from W. L. Stewart (VA Power) to H. R. Denton (USNRC), "Additional Information Related to NUREG-0737, Item II.D.1, Performance Testing of Relief and Safety Valves," NRC Letter No. 86-094, dated February 28, 1986.

ATTACHMENT 3

10 CFR 50.92 Evaluation

Surry Power Station

Units 1 and 2

10 CFR 50.59 Evaluation

The proposed changes have been reviewed against the criteria of 10 CFR 50.59. This review concluded that these changes raise no unreviewed safety questions. This basis for this determination is as follows.

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated are not increased. Affected safety related parameters were analyzed for a change to Surry Units 1 and 2 Technical Specification 3.1.A.3.c. Although peak pressures were slightly higher than those currently documented in the UFSAR, the analyses confirmed that the primary and secondary pressure safety limits would not be exceeded in the most limiting overpressure transients (the Loss of Load and Locked Rotor events) with the pressurizer safety valve lift setpoint tolerance increased to 3%. Corresponding evaluations for DNBR established that the proposed changes present no impact on the current DNBR analyses. In addition, operational margins were reviewed to determine that the increased setpoint tolerance will not result in an inadvertent opening of the pressurizer safety valves. Since the proposed change involves no alterations to the physical plant, the probability of occurrence or consequence of a malfunction of equipment important to safety previously evaluated is also not increased. As noted, the as-left tolerance remains as previously specified; therefore, no difference in PSV performance is expected as a result of this change.

2. The possibility of an accident or malfunction of a different type than any evaluated previously in the safety analysis report is not created.

The proposed change to Surry Units 1 and 2 Technical Specification 3.1.A.3.c does not involve any alterations to the physical plant which would introduce any new or unique operational modes or accident precursors. Only the allowable tolerance about the existing setpoint will be changed. Furthermore, the as-left tolerance will remain unchanged, so no difference in PSV operation is expected as a result of this change.

3. The margin of safety as defined in the basis of the technical specifications is not reduced. It was determined that the most limiting overpressure transients do not result in a maximum pressure in excess of the overpressure safety limit. In addition, the DNBR results of affected transients are not made more limiting by the proposed setpoint tolerance increase. Therefore, the margin of safety is unchanged by the proposed increase in the safety valve setpoint tolerance.

BASIS FOR NO SIGNIFICANT HAZARDS DETERMINATION

The proposed changes do not involve a significant hazards consideration because operation of Surry Units 1 and 2 in accordance with this change would not:

a. involve a significant increase in the probability or consequence of an accident previously evaluated in the UFSAR. Although peak pressures were determined to be slightly higher than those currently documented in the UFSAR, this was determined to not be significant because the primary and secondary pressure safety limits would not be exceeded in the most limiting overpressure transients (the Loss of Load and Locked Rotor events) with the pressurizer safety valve lift setpoint tolerance increased to 3%. Corresponding DNBR evaluations establish that the proposed change presents no impact on current DNBR analyses. Finally, operational margins were reviewed to determine that the increased setpoint tolerance will not result in an inadvertent opening of the pressurizer safety valves. Since the proposed change involves no alterations to the physical plant and the as-left tolerance remains as presently specified, the probability of occurrence or consequence of malfunction of equipment important to safety previously evaluated is also not increased.

b. create the possibility of a new or different kind of accident from any accident previously identified because the proposed change to Surry Units 1 and 2 Technical Specification 3.1.A.3.c does not involve any alterations to the physical plant which would

introduce any new or unique operational modes or accident precursors. Only the allowable tolerance about the existing setpoints will be changed. Furthermore, the as-left tolerance will remain unchanged, so no difference in PSV operation or performance is expected by this change.

c. involve a significant reduction in a margin of safety. It was determined that the most limiting overpressure transients do not result in a maximum pressure in excess of the overpressure safety limit. In addition, the DNBR results of affected transients are not made more limiting by the proposed setpoint tolerance increase. Therefore, the margin of safety is unchanged by the proposed increase in the safety valve setpoint tolerances.

Therefore, pursuant to 10 CFR 50.92, based on the above considerations, it has been determined that these changes do not involve a significant safety hazards consideration.