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May 31, 1990

U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D.C. 20555

Attention: Document Control Desk

Gentlemen:

SUBJECT: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-29
Standby Liquid Control System
Specification 3.1.5 Proposed
Amendment to the Operating
License (PCOL-89/03 Revision 1)
AECM-90/0012

On June 19, 1989 System Energy Resources, Inc. (SERI) submitted proposed revisions to the Grand Gulf Nuclear Station Technical Specifications (TS) pertaining to the Standby Liquid Control System (AECM-89/0063). The proposed revisions requested revisions to the TS based on a self-initiated Safety System Functional Assessment performed by SERI.

Subsequent discussions with the NRC staff on July 21, 1989 and September 29, 1989 and the NRC staff request for additional information dated March 29, 1990 (MAEC-90/0072) have resulted in the attached revisions to the initial application.

The SERI response to the request for additional information is provided as Attachment 2.

The revised TS and application are provided as Attachment 3.

The response to specific NRC questions asked during the July 21, 1989 and September 29, 1989 discussions are provided as Attachment 4.

In accordance with the provisions of 10CFR50.4, the signed original of the requested amendment is enclosed. This amendment has been reviewed and accepted by the Plant Safety Review Committee. The Safety Review Committee reviewed and approved the original application.

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Based on the guidelines presented in 10CFR50.92, SERI has concluded that this proposed amendment involves no significant hazards considerations.

Yours truly,

W T Cottle

WTC:mtc
Attachments: 1. Affirmation per 10CFR50.30
2. SERI Response to RAI
3. GGNS PCOL-89/03, Rev. 1
4. SERI Responses to July 21, 1989 and September 29, 1989 NRC Questions

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BEFORE THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

LICENSE NO. NPF-29

DOCKET NO. 50-416

IN THE MATTER OF

MISSISSIPPI POWER & LIGHT COMPANY
and
SYSTEM ENERGY RESOURCES, INC.
and
SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION

AFFIRMATION

I, W. T. Cottle, being duly sworn, state that I am Vice President, Nuclear Operations of System Energy Resources, Inc.; that on behalf of System Energy Resources, Inc., and South Mississippi Electric Power Association I am authorized by System Energy Resources, Inc. to sign and file with the Nuclear Regulatory Commission, this application for amendment of the Operating License of the Grand Gulf Nuclear Station; that I signed this application as Vice President, Nuclear Operations of System Energy Resources, Inc.; and that the statements made and the matters set forth therein are true and correct to the best of my knowledge, information and belief.

W. T. Cottle

STATE OF MISSISSIPPI
COUNTY OF CLAIBORNE

SUBSCRIBED AND SWORN TO before me, a Notary Public, in and for the County and State above named, this 31 day of May, 1990.

(SEAL)

Patricia Heaghegan
Notary Public

My Commission Expires July 1, 1993

My commission expires: _____

SERI RESPONSE TO THE REQUEST FOR ADDITIONAL INFORMATION REGARDING TECHNICAL SPECIFICATION CHANGES FOR THE STANDBY LIQUID CONTROL SYSTEM

Request No 1

TS Figure 3.1.5-1, as proposed, provides a better way of defining allowable operability conditions for the standby liquid control system. It clearly determines the allowable concentration range of sodium pentaborate which could be effectively maintained by the system and the corresponding volumes of solution which constitute directly measurable quantities. However, validity of the graph in Figure 3.1.5-1 is temperature dependent. If the temperature of the solution exceeds a certain value, its specific volume may become too high to hold enough sodium pentaborate in the net tank volume specified by the graph. Actually this was found to be the case for the 13.6 percent solution at the upper limit of the specified containment air temperature range (100°F). In order to prevent this from happening, the limiting temperature of the solution for which the graph in Figure 3.1.5-1 is valid should be specified on the figure. Provide a revised figure with the limiting temperature on it.

SERI Response

The figure titled "Sodium Pentaborate Solution Concentration/Available Volume Requirements" has been revised to specify the required temperature range (75°F-130°F) associated with the acceptable operation region. Attachment 3 of this submittal contains the revised figure, now labeled Figure 3.1.5-2.

Request No. 2

Another TS modification proposed by the licensee consists of assuring solubility of sodium pentaborate in the pump suction piping, not by relying on an operable heat tracing circuitry, but by maintaining and monitoring solution temperature within the range of 75°F and 130°F. The 75° temperature provides approximately 5°F margin to the saturation temperature for the maximum allowable concentration of sodium pentaborate (15.2 percent). The upper limit of the temperature range is determined by the operability requirements of the pump and includes a margin of 20°F. This change is reflected in the proposed amendments to TS 4.1.5.a and the Footnote to TS 4.1.5.d.3. The licensee states that with the new concentration ranges there will be no need for heat tracing of the pump suction pipe because containment air temperature will be maintained in the range of 70°F to 100°F which would maintain the solution above the saturation temperature hence the surveillance requirement for the heat tracing circuits can be removed from TS 4.1.5.a and Footnote to TS 4.1.5.d.3. Although in most cases, the containment air temperature will remain within the range specified for the pump suction piping (75°F to 130°F) it does not constitute a fully controllable quantity and cannot be relied upon at all times. For example, it may drop below 70°F when the reactor is shutdown and the containment is opened during a refueling operation. The heat tracing should still be retained as a means for maintaining solution temperature. The TS should retain, therefore, surveillance requirements to assure that the heat tracing circuits remain in operable condition. Provide a revision to your application to retain surveillance requirements in TS 4.1.5.a.3 for the heat tracing circuits and in the Footnote to TS 4.1.5.d.3.

SER1 Response

The initial application submitted by letter dated June 19, 1989 (AECM-89/0063) has been revised to provide surveillance requirements for the Standby Liquid Control System heat tracing circuitry. The proposed revisions to Technical Specification 3/4.1.5 are included in Attachment 3 of this submittal.

A. SUBJECT

1. NPE-88/05 — Standby Liquid Control System (SLCS) Technical Specification 3.1.5 Change

2. Affected Technical Specifications - Reactivity Control Systems Standby Liquid Control System:

   a. Limiting Condition for Operation 3.1.5 - page 3/4 1-18.

   b. Applicability - page 3/4 1-18.

   c. Action Statements - page 3/4 1-18.

   d. Surveillance Requirements 4.1.5 - pages 3/4 1-18 and 3/4 1-19.

   e. Figure 3.1.5.1 - page 3/4 1-20.

   f. Bases 3/4.1.5 - page B 3/4 1-4.

B. DISCUSSION

In August 1988, System Energy Resources, Inc. (SERI) performed a self-initiated Safety System Functional Assessment (SSFA) for the Standby Liquid Control System (SLCS). This SSFA concluded that the SLCS was generally well maintained, tested and operated in a manner to assure the system will function as designed upon operator initiation, but identified a number of potential improvements to the operational readiness of the system. Based upon these findings, the following changes are proposed:

1. LIMITING CONDITION FOR OPERATION 3.1.5 is revised to require at least one division of heat tracing circuitry on the pumps suction piping to be OPERABLE in OPERATIONAL CONDITIONS 3#, 4# and 5#. The "#" condition being when sodium pentaborate solution is in the SLCS storage tank.

2. The APPLICABILITY is revised to reflect the requirement for at least one division of heat tracing circuitry on the pumps suction piping to be OPERABLE in OPERATIONAL CONDITIONS 1, 2, 3#, 4#, 5#, and 5*.

3. ACTION statement 3.1.5.c is added to specify the corrective action to be taken if neither division of heat tracing circuitry is OPERABLE during OPERATIONAL CONDITIONS 1, 2, 3#, 4#, 5# and 5*.

4. ACTION statement 3.1.5.d is added to specify the corrective measures to be taken if the sodium pentaborate concentration exceeds 15.2 weight percent during OPERATIONAL CONDITIONS 1 and 2.

5. SURVEILLANCE REQUIREMENTS 4.1.5.a.1 and 4.1.5.a.3 are revised to specify minimum sodium pentaborate solution and SLCS pumps suction piping temperatures of 75°F, and maximum temperatures of 130°F. SURVEILLANCE REQUIREMENT 4.1.5.a.3 is also revised to include a requirement that power must be verified available to at least one division of heat tracing circuitry. SURVEILLANCE REQUIREMENT 4.1.5.a.2 is revised to replace the 4530 gallon minimum available solution volume with a reference to FIGURE 3.1.5-2.

6. SURVEILLANCE REQUIREMENT 4.1.5.b is added to specify the requirements to demonstrate heat tracing operability in OPERATIONAL CONDITIONS 3#, 4# and 5#. Also, the subsequent existing SURVEILLANCE REQUIREMENTS are relettered to reflect the addition of 4.1.5.b.

7. Existing SURVEILLANCE REQUIREMENT 4.1.5.b.3 is revised to delete a definition for minimum sodium pentaborate weight.

   The "*" footnote to current SURVEILLANCE REQUIREMENT 4.1.5.b.3 is revised to replace a reference to existing FIGURE 3.1.5-1 with a specific temperature limit of 75°F.

8. Existing SURVEILLANCE REQUIREMENT 4.1.5.d.3 and the "**" footnote are revised to reflect the addition of ACTION statement 3.1.5.c.

9. FIGURE 3.1.5-1 is modified to show the SLCS solution minimum temperature limit.

10. FIGURE 3.1.5-2 is added to show the concentration vs. available volume relationship for the SLCS sodium pentaborate solution. A note on the figure indicates the applicable temperature range.

11. The minimum available quantity of sodium pentaborate specified in BASES 3/4.1.5 is revised to delete the minimum solution volume reference. Additionally, BASES 3/4.1.5 is revised to refer to FIGURE 3.1.5-2 in the discussion of minimum storage volume and to describe the acceptable region of operation.

C. JUSTIFICATION

1. The existing LIMITING CONDITION FOR OPERATION addresses the heat tracing operability only to the extent that the SURVEILLANCE REQUIREMENTS for heat tracing must be performed when the SLCS subsystems are required to be OPERABLE. Therefore, since the existing applicability is for OPERATIONAL CONDITIONS 1, 2, and 5*, there is no requirement for heat tracing surveillance during OPERATIONAL CONDITIONS 3, 4 and 5.

The LIMITING CONDITION FOR OPERATION and APPLICABILITY for the SLCS subsystems are not changed by the proposed revision. Both SLCS subsystems are required to be OPERABLE in OPERATIONAL CONDITIONS 1, 2 and 5* (i.e., with any control rod withdrawn). However, the LIMITING CONDITION FOR OPERATION and the APPLICABILITY are revised to require the pump suction piping heat tracing to be OPERABLE in all OPERATIONAL CONDITIONS whenever sodium pentaborate solution is in the SLCS storage tank. This will ensure that heat tracing inoperability will not go undetected during OPERATIONAL CONDITIONS when the SLCS subsystems are not required to be OPERABLE. To demonstrate heat tracing operability only SURVEILLANCE REQUIREMENT 4.1.5.b.3 must be performed, which requires once per 24 hours, in OPERATIONAL CONDITIONS 3#, 4# and 5#, the operators to verify that: 1) power is available to at least one division of heat tracing circuitry and, 2) the pumps suction piping temperature is equal to or greater than 75°F.

2. The existing ACTION statements do not contain ACTIONS for OPERATIONAL CONDITIONS 3#, 4# and 5#, because the SLCS subsystems are not required to be OPERABLE.

   With the addition of requirements to perform surveillance on the SLCS pump suction piping heat tracing in OPERATIONAL CONDITIONS 3#, 4# and 5# comes the need for an applicable ACTION statement. Therefore, ACTION statement 3.1.5.c is added to indicate the corrective action to be taken if both divisions of heat tracing circuitry are found to be inoperable in OPERATIONAL CONDITIONS 1, 2, 3#, 4#, 5#, and 5*. The intent of the heat tracing surveillance is to ensure that sodium pentaborate remains in solution and, thus, the pump suction piping does not plug. Therefore, ACTION statement 3.1.5.c.2 requires that a flow test be completed if both divisions of heat tracing circuitry are found inoperable and the pumps suction piping temperature decreases to less than 75°F. This action, which verifies the suction piping is not plugged, must be completed before the SLCS subsystems can be restored to the OPERABLE status.

   In the current TS, the action to take for inoperable heat tracing is specified in the "**" footnote to SURVEILLANCE REQUIREMENT 4.1.5.d.3. By the addition of ACTION statement 3.1.5.c, the action provisions of the "**" footnote will be no longer necessary. Therefore, the "**" footnote can be deleted and the method of performing the flow tests can be added to proposed SURVEILLANCE REQUIREMENT 4.1.5.e.3.

3. The saturation temperature of the sodium pentaborate solution at its design concentration is approximately 70°F. The equipment containing the solution is installed in an area in which the air temperature is normally within the range of 70°F to 100°F. An electrical resistance heater system provides a backup heat source to the environment and maintains the solution temperature between 85°F and 95°F. Electric heat tracing is provided as a backup heat source for the piping from the storage tank outlet to the SLCS pump suction to maintain the solution in the piping above its saturation temperature.

In the existing Specification 4.1.5.a, the temperature for the sodium pentaborate solution and the pump suction piping is defined by the temperature vs. concentration relationship in existing FIGURE 3.1.5-1. Based upon allowable concentrations ranging from 13.6% to 28% by weight in the existing figure, the temperature requirement varies from approximately 67°F to 130°F.

In the revised Specification 4.1.5.a, the minimum temperature of the sodium pentaborate solution and pump suction piping is specified as 75°F. This limit is based upon the temperature required to keep the sodium pentaborate in solution for all concentrations permitted by proposed FIGURE 3.1.5-2. At the maximum concentration of 15.2% by weight, the saturation temperature is approximately 70°F. The saturation temperature decreases as concentration decreases below 15.2%. A 5°F margin is added to the most limiting saturation temperature to obtain the minimum temperature specified for the solution and suction piping. This conservatism factor is established from the SLCS design specification for Grand Gulf Nuclear Station to provide additional assurance that the sodium pentaborate does not precipitate out of solution.

In the revised Specification 4.1.5.a, the maximum temperature of the sodium pentaborate solution and pump suction piping is specified as 130°F. This limit is based on the maximum temperature assumed in the Net Positive Suction Head (NPSH) calculation for the SLCS with both pumps operating. This maximum temperature limit also provides margin to the 150°F temperature rating of the SLCS piping. The 5°F conservatism incorporated into the minimum solution temperature limit is not applied to the maximum solution temperature because this margin is only required to ensure the solution is maintained above its saturation temperature.

Specification 4.1.5.a.2 is revised to refer to FIGURE 3.1.5-2 for the minimum available solution volume instead of specifying 4530 gallons. This 4530 gallons does not constitute the minimum acceptable volume for solution concentrations greater than 14.4% by weight; it only constitutes the minimum volume at the design concentration of 14.4% by weight. FIGURE 3.1.5-2 defines acceptable solution concentration and volume conditions which ensure at least the design minimum sodium pentaborate weight is available. This change does not affect the intent of Specification 4.1.5.a.2, which is to to ensure sufficient sodium pentaborate solution is available.

In the existing Specification 4.1.5.a.3, heat tracing operability is determined by surveillance of the SLCS pump suction piping temperature. There is no required surveillance of the heat tracing power supplies.

In the revised Specification 4.1.5.a.3 and 4.1.5.b, the pump suction temperature limits previously discussed are retained, but only as as a portion of the heat tracing surveillance. An additional requirement is included in the revised specification; i.e., power must be determined to be available to at least one division of heat tracing circuitry, regardless of pump suction piping temperature. The SLCS pump suction piping is provided with two divisions of heat tracing circuitry for redundancy. The operability of both circuits cannot be readily determined during normal operation, because only one circuit is required to maintain the necessary temperature, and the circuit is only energized periodically. However, lights which indicate that power is available to the individual heat tracing circuits and controllers are checked once per 24 hours by operators in OPERATIONAL CONDITIONS 1, 2, 3#, 4#, 5# and 5*. These checks, in combination with the SLCS pump suction piping temperatures which are also taken once per 24 hours in OPERATIONAL CONDITIONS 1, 2, 3#, 4#, 5#, and 5*, are adequate to satisfy the surveillance intent of ensuring the sodium pentaborate remains in solution and the piping remains unplugged whenever sodium pentaborate solution is in the SLCS storage tank.

4. In the existing Specification 4.1.5.b.3, the minimum sodium pentaborate weight was established from the amount of neutron absorber required to provide the necessary core shutdown margin. This surveillance requirement was necessary to ensure adequate concentrations of sodium pentaborate solution were maintained as available solution volumes approached minimum.

   In the revised Specification 4.1.5.c.3, the minimum sodium pentaborate weight is deleted because the concentration vs. available solution volume relationship in proposed FIGURE 3.1.5-2 ensures at least the design minimum sodium pentaborate weight is available for all allowable volumes. At least 5803 pounds of sodium pentaborate is available at every point within the acceptable region on the figure. Verifying the solution concentration/volume is in the acceptable region of FIGURE 3.1.5-2 satisfies the surveillance intent to ensure at least the design minimum sodium pentaborate weight is available.

   The temperature indicated in footnote "*" to SURVEILLANCE REQUIREMENT 4.1.5.c.3 is 75°F. This limit is based upon the saturation temperature of the solution and the conservatism factor as described previously under item C.3.

5. The standby liquid control system is manually initiated from the main control room to pump a boron neutron absorber solution into the reactor. The specified neutron absorber solution is sodium pentaborate prepared by dissolving stoichiometric quantities of borax and boric acid in demineralized water. At all times when possible to make the reactor critical (OPERATIONAL CONDITIONS 1, 2 and 5*), the SLCS is OPERABLE to deliver enough sodium pentaborate solution to assure reactor shutdown.

In the existing FIGURE 3.1.5-1, the required solution temperature and concentration is defined within a triangular region on the figure. The upper bound on solution temperature was established at 130°F to provide adequate suction head for the SLCS pumps and margin to the 150°F design temperature rating of the piping. The lower bound on solution concentration was established at 13.6% by weight based upon the two pump design flow rate of 82.4 gpm to provide the ability to mitigate an anticipated transient without scram (ATWS) event in accordance with 10CFR50.62. The concentration dependent temperature was established from the sodium pentaborate solution saturation temperature curve to ensure the sodium pentaborate remains in solution.

In proposed FIGURE 3.1.5-2, the required solution concentration and available volume is defined within a trapezoidal region on the figure. The lower bound on solution concentration is established at 13.6% by weight based upon the two pump design flow rate of 82.4 gpm to provide the ability to mitigate an ATWS event in accordance with 10CFR50.62. The upper bound on solution concentration is established at 15.2% by weight to ensure, in conjunction with the revised Specification 4.1.5.a.1 requirement for minimum solution temperature, adequate margin to the saturation temperature for the solution is maintained. The upper bound on available solution volume is established from the tank overflow design which limits the tank volume to 5088 gallons. The volume dependent concentration limit is established from the design minimum weight of sodium pentaborate (5803 pounds) required to provide the necessary core shutdown margin.

The design minimum weight of sodium pentaborate is based on the minimum boron concentration in the reactor required for cold (68°F), xenon-free shutdown and the weight of water at reactor vessel level 8 including the recirculation loops and one Residual Heat Removal (RHR) shutdown cooling subsystem. An additional 25% is applied to this calculated minimum boron concentration to account for leakage and imperfect mixing. At every acceptable concentration and volume point in FIGURE 3.1.5-2, this design minimum weight of sodium pentaborate is available.

The SLCS storage tank heaters and heat tracing circuitry for the pumps suction piping maintain the sodium pentaborate solution temperature essentially constant. The heaters and heat tracing are designed to maintain the solution temperature between 85°F and 95°F. This design minimizes the need for the temperature vs. concentration relationship in the present figure.

Proposed FIGURE 3.1.5-2 is consistent with the Updated Final Safety Analysis Report (UFSAR) Section 9.3.5.2 discussion on saturation temperature requirements, the UFSAR Section 9.3.5.3 safety evaluation with respect to boron concentration and ATWS capability, and the 10CFR50.62 requirement on sodium pentaborate concentrations for ATWS.

FIGURE 3.1.5-2 reduces an instrumentation error associated with SLCS storage tank level. The differential pressure transmitter for this level instrument is calibrated with water and the level setpoints are biased to compensate for the higher specific gravity of the sodium pentaborate solution. By restricting the allowable concentration to between 13.6% and 15.2% by weight, the accuracy of the SLCS storage tank level indication is improved by minimizing the density effects of the measured fluid.

FIGURE 3.1.5-2 represents a consolidation of requirements on the amount of sodium pentaborate maintained in the SLCS storage tank to enhance the implementation of the requirements while retaining all of the safety margins from the present specifications. The proposed FIGURE 3.1.5-2 is taken directly from the Grand Gulf SLCS design specification and its associated data sheet.

6. If through the performance of revised SURVEILLANCE REQUIREMENT 4.1.5.c.3 during OPERATIONAL CONDITIONS 1 and 2 the sodium pentaborate concentration is determined to be outside the acceptable operation region of proposed FIGURE 3.1.5-2, current TS 3.1.5 would require both SLCS subsystems be declared inoperable. ACTION 3.1.5.a.2, which is applicable during OPERATIONAL CONDITIONS 1 and 2, would require at least one subsystem be restored to OPERABLE status within eight hours or the plant must be in HOT SHUTDOWN within the next twelve hours.

Proposed FIGURE 3.1.5-2 specifies the acceptable SLCS sodium pentaborate solution concentration to be within the band of 13.6% by weight to 15.2% by weight. As discussed above in C.5, the lower concentration limit is based upon the SLCS mitigating an ATWS event and the upper concentration limit is based upon maintaining adequate margin between the minimum SLCS solution temperature (75°F) permitted by proposed TS 4.1.5.a.1 and the solution saturation temperature.

The upper concentration limit is necessary to prevent precipitation of the sodium pentaborate out of solution at the minimum temperature expected for the SLCS. The upper concentration limit is therefore established essentially to prevent blockage of the SLCS piping as opposed to the lower concentration limit which is established analytically to assure mitigation of an ATWS event. As long as the sodium pentaborate solution temperature is maintained above the saturation temperature for the given concentration no real operability problem exists. However, because of the possibility of sodium pentaborate precipitating out of solution if the solution temperature were to drop below the saturation temperature, continued plant operation is not prudent.

ACTION 3.1.5.d is therefore proposed to specify the corrective measures to be taken if the sodium pentaborate concentration exceeds the upper concentration limit (15.2 weight percent) during OPERATIONAL CONDITIONS 1 or 2. The proposed ACTION 3.1.5.d would permit seventy two hours to restore the sodium pentaborate concentration to within acceptable limits. The seventy two hour restoration time will be allowed; however, only when the sodium pentaborate solution temperature is greater than or equal to the SLCS solution minimum temperature limit of proposed FIGURE 3.1.5-1 and within acceptable tank volume limits. The proposed ACTION will require verification of being in the acceptable operation region of Figure 3.1.5-1 once per four hours.

Proposed FIGURE 3.1.5-1 is a plot of minimum solution temperature vs. sodium pentaborate concentration. Two areas are shown on the proposed figure: (1) the area of normal operation and (2) the area of acceptable (short term) operation. The SLCS solution minimum temperature limit is determined by adding the 5°F temperature margin discussed in C.3 above to the saturation temperature for the corresponding saturation concentration. Requiring the sodium pentaborate solution temperature to be greater than or equal to the SLCS solution minimum temperature limit for the measured SLCS sodium pentaborate concentration when the measured concentration exceeds 15.2 weight percent will ensure sodium pentaborate precipitation will not occur.

If the conditions of proposed ACTION 3.1.5.d.1 are met, then seventy two hours will be permitted to restore the sodium pentaborate solution to within the normal and acceptable operation regions of proposed FIGURES 3.1.5-1 and 3.1.5-2, respectively. The seventy two hour time period was chosen to allow sufficient time to restore the sodium pentaborate solution to within TS limits and is based upon the knowledge and experience gained by GGNS operations personnel during previous sodium pentaborate solution concentration excursions. The frequency for the verification of SLCS solution temperature is increased from once per twenty four hours to once per four hours. The increased monitoring during the restoration period will ensure the SLCS solution temperature will be at least 5°F above the corresponding saturation temperature; thereby, allowing no sodium pentaborate precipitation.

If the conditions of proposed ACTION 3.1.5.d.1 are not met (e.g., solution temperature less than SLCS solution minimum temperature limit for the measured concentration) than ACTION 3.1.5.d.2 will apply. The proposed ACTION 3.1.5.d.2 will require both SLCS subsystems be declared inoperable and the plant be in at least HOT SHUTDOWN within the next twelve hours which is consistent with current ACTION 3.1.5.a.2.

The proposed ACTION 3.1.5.d and Figure 3.1.5-1 will allow sufficient time to return the SLCS solution to within TS limits without causing the plant to go unnecessarily through the transient process of shutdown.

7. In the existing BASES 3/4.1.5, the minimum available volume of 4530 gallons was established from the volume of sodium pentaborate solution at the design concentration of 14.4% by weight which provided the design minimum weight of sodium pentaborate.

   In the revised BASES 3/4.1.5, the minimum available volume reference is deleted because the concentration vs. available solution volume relationship in proposed FIGURE 3.1.5-2 ensures at least the design minimum weight of sodium pentaborate is available for all acceptable volumes.

D. NO SIGNIFICANT HAZARDS CONSIDERATIONS

SERI is proposing with this amendment request a revision to TS 3.1.5 which would:

1) Provide more restrictive LIMITING CONDITIONS FOR OPERATION for the SLCS pumps suction piping heat tracing.

2) Add additional ACTIONS to specify remedial measures to be taken when the SLCS pumps suction piping heat tracing becomes inoperable and when the SLCS sodium pentaborate solution concentration is outside acceptable operation limits.

3) Provide a more restrictive operating band on the SLCS storage tank sodium pentaborate solution concentration.

The aforementioned revisions are SERI identified improvements which are the result of a self-initiated Safety System Functional Assessment performed for the Standby Liquid Control System.

The Commission has provided standards for determining whether a no significant hazards consideration exists as stated in 10CFR50.92(c). A proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

SERI has evaluated the no significant hazards considerations in its request for a license amendment. In accordance with 10CFR50.91(a), SERI is providing the analysis of the proposed amendment against the three standards in 10CFR50.92:

1. No significant increase in the probability or consequences of an accident previously evaluated results from this change.

   a. The standby liquid control system (SLCS) safety design basis is to deliver sufficient neutron absorber solution to the reactor vessel to assure reactor shutdown in the unlikely event of a failure of the primary reactivity control system or anticipated transient without scram (ATWS). Because SLCS is completely independent of the normal means of shutting down the reactor

(control rod drive system), changes to the SLCS will not affect the control rod drive system. Since the control rod drive system will remain unaffected, the probability of failure of the control rod drive system (e.g., ATWS event) will not change. Therefore, the probability of an ATWS remains unchanged by the proposed amendment.

b. The revised sodium pentaborate solution and pump suction piping temperature requirements prevent precipitation of the sodium pentaborate out of solution.

c. The revised sodium pentaborate solution volume and concentration requirements ensure SLCS has adequate neutron absorber solution for reactor shutdown from the most reactive state with allowance for solution leakage and imperfect mixing.

d. The change in surveillance requirements for the SLCS will not significantly affect the reliability of the system. The revised surveillance requirement to verify pump suction piping temperature as well as power availability to the heat tracing circuitry will not result in a decrease in the assurance that the sodium pentaborate solution is maintained above its saturation temperature. The revised surveillance requirements do not decrease the frequency of testing. The inservice inspection and functional testing of the SLCS is not affected by this change. The deletion of the requirement to determine the available weight of sodium pentaborate has no effect because all the points specified in the new Figure 3.1.5-1 in the acceptable region meet the minimum acceptable weight necessary. Therefore, the requirement to determine the weight is redundant since as long as the concentration and volume of the tank are within the acceptable operation region, minimum weight requirements are satisfied.

e. The design and operation of the SLCS remains within the existing design basis for the system. The ability of the system to deliver at least the design minimum weight of sodium pentaborate to the reactor vessel at design flow rates is not affected by this change.

f. Therefore, the probability or consequences of previously analyzed accidents are not increased.

2. This change would not create the possibility of a new or different kind of accident from any previously analyzed.

a. This change does not involve a physical change in any system's configuration.

b. No new mode of operation is introduced by this change. This change maintains SLCS operable at all times when it is possible to make the reactor critical.

c. Therefore, this change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. This change would not involve a significant reduction in the margin of safety.

   a. The sodium pentaborate solution volume requirements satisfy the design bases for the system. The solution and pump suction piping temperature limits and the solution concentration levels are more restrictive than currently allowed. The current TS could have resulted in system temperatures below the saturation temperature. The proposed change increases the margin of safety between the saturation temperature and the operating temperature since the operating temperature has been raised. The margin of safety for the boron concentration remains unchanged since the minimum concentration of 13.6% is unaltered by the proposed change.

   b. This change does not affect the ability of the SLCS to assure reactor shutdown independent of control rod insertion. This change is in accordance with the requirements of 10CFR50.62.

   c. Therefore, this change will not involve a significant reduction in the margin of safety.

Therefore, based on the above evaluation, operation in accordance with the proposed amendment involves no significant hazards considerations.