



**Entergy
Operations**

Entergy Operations, Inc.
P.O. Box 756
Port Gibson, MS 39150
Tel: 601-437-6408

December 7, 1990

W. T. Cottie
Vice President
Operations
Grand Gulf Nuclear Station

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 3/4.1.5 Proposed
Amendment to the Operating
License (PCOL-89/03 Revision 2)
AECM-90/0199**

On June 19, 1989 Entergy Operations, Inc. submitted a proposed amendment to the Grand Gulf Nuclear Station Technical Specifications (TS) pertaining to the Standby Liquid Control System (SLCS) (AECM-89/0063). The proposed amendment requested revisions to the TS based on potential enhancements identified during a self-initiated Safety System Functional Assessment performed by Entergy Operations, Inc.

Entergy Operations, Inc. revised the initial application in a resubmittal dated May 31, 1990 (AECM-90/0012) based on 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).

On November 6, 1990, a meeting was held between the NRC Staff and Entergy Operations, Inc. to discuss, among other things, unresolved issues related to the May 31, 1990 resubmittal. In that meeting, it was our understanding that the technical reviewers agreed with the following:

1. The proposed TS changes were enhancements (additional restrictions) to the current SLCS TS which had previously been found acceptable by the Staff,
2. The addition of heat tracing operability requirements in Operational Conditions 3, 4 and 5 is not appropriate because the SLCS is not required operable during those Operational Conditions and
3. The existing TS surveillance requirements, SLCS design and operation were sufficient to ensure no boron precipitation in Operational Conditions where SLCS is required operable.

Entergy Operations, Inc. agreed to revise and resubmit the proposed TS changes. The revised application, which reflects both the changes proposed by Entergy Operations, Inc. and those requested by the Staff during the November 6, 1990 meeting, is provided as Attachment 2.

A9011153/SNLICFLR - 1

9012110247 901207
PDR AD0CK 05000416
P PDC

A001
1/1

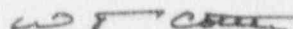
The NRC issued a summary of the November 6, 1990 meeting in a letter dated November 30, 1990 (MAEC-90/0299). In the November 30, 1990 letter, the NRC included Staff conclusions applicable to the proposed SLCS amendment. Based on further discussions with the Staff, we understand that the conclusions do not represent Staff positions but rather suggestions for consideration. After careful consideration, Entergy Operations, Inc. has decided to incorporate selected suggestions (e.g., deletion of heat tracing requirements in Operational Conditions 3, and 5). Those suggestions not incorporated have been judged to be inconsistent with the intent of the proposed amendment.

We appreciate the opportunity to meet with the reviewers on this proposed amendment and trust that the issue resolutions aired during the meeting and reflected in this revised amendment request are sufficient to close this long-outstanding proposal.

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

Based on the guidelines presented in 10CFR50.92, Entergy Operations, Inc. has concluded that this application involves no significant hazards considerations.

Yours truly,



WTC/FRS:tkm

Attachments: 1. Affirmation per 10CFR50.30
2. GGNS PCOL-89/03, Rev. 2

cc: (See Next Page)

cc: Mr. D. C. Hintz (w/a)
Mr. R. B. McGehee (w/a)
Mr. N. S. Reynolds (w/a)
Mr. H. L. Thomas (w/o)
Mr. J. Mathis (w/a)

Mr. Stewart D. Ebnetter (w/a)
Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
101 Marietta St., N.W., Suite 2900
Atlanta, Georgia 30323

Mr. L. L. Kintner, Project Manager (w/a)
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop 11D21
Washington, D.C. 20555

Dr. Alton B. Cobb (w/a)
State Health Officer
State Board of Health
P.O. Box 1700
Jackson, Mississippi 39205

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
and
ENTERGY OPERATIONS, INC.

AFFIRMATION

I, W. T. Cottle, being duly sworn, state that I am Vice President, Operations GGNS of Entergy Operations, Inc.; that on behalf of Entergy Operations, Inc., System Energy Resources, Inc., and South Mississippi Electric Power Association I am authorized by Entergy Operations, 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, Operations GGNS of Entergy Operations, 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
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 7 day of December, 1990.

(SEAL)

Patricia Magghegan
Notary Public

My commission expires:
My Commission Expires July 1, 1998

A. SUBJECT

1. NPE-88/05 Standby Liquid Control System (SLCS) Technical Specification 3/4.1.5 Change
2. Affected Technical Specifications - Reactivity Control Systems Standby Liquid Control System:
 - a. Action Statements - page 3/4 1-18.
 - b. Surveillance Requirements 4.1.5 - pages 3/4 1-18 and 3/4 1-19.
 - c. Figure 3.1.5.1 - page 3/4 1-20.
 - d. Bases 3/4.1.5 - pages B 3/4 1-4 and B 3/4 1-4a.

B. DISCUSSION

In August 1988, Entergy Operations, Inc. 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. The existing Technical Specifications (TS) SURVEILLANCE REQUIREMENTS, SLCS design and operation are sufficient to ensure no sodium pentaborate precipitation in OPERATIONAL CONDITIONS (1, 2, and 5*) when the SLCS is required OPERABLE. There are no deficiencies in the current TS or in the design and operation of the SLCS. However, the SSFA identified potential improvements to the operational readiness of the system. In order to implement these improvements, the following TS changes are proposed:

1. 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.
2. 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.

3. The "***" footnote to SURVEILLANCE REQUIREMENT 4.1.5.d.3 is revised to specify pump suction piping temperature rather than heat tracing circuit operability as the parameter used to trigger increased surveillance testing.
4. FIGURE 3.1.5-1 is modified to show the SLCS solution minimum temperature limit.

5. FIGURE 3.1.5-2 is added to show the concentration vs. available volume relationship for the SLCS sodium pentaborate solution.
6. ACTION statement 3.1.5.a.3 is added to specify the corrective measures to be taken if the sodium pentaborate concentration exceeds 15.2 weight percent during OPERATIONAL CONDITIONS 1 or 2.
7. 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 region of normal operation.

C. JUSTIFICATION

It is important to note that TS 3/4.1.5, as presently written, provides adequate assurance that the SLCS will perform its safety function. The proposed TS changes constitute additional restrictions on operation of the SLCS, the net effect of which is to provide more frequent surveillance of sodium pentaborate when operating at relatively high (albeit acceptable) concentration levels.

1. SURVEILLANCE REQUIREMENTS 4.1.5.a.1, 2 and 3

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. The minimum solution and piping temperature, combined with the concentration restrictions of proposed FIGURE 3.1.5-2, are at all times bounded by the existing TS 3/4.1.5.

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 - the same value used in existing FIGURE 3.1.5-1.

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 for a nominal solution temperature of 90°F which ensure at least the design minimum sodium pentaborate weight is available. This change improves upon the intent of Specification 4.1.5.a.2, which is 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, the pump suction temperature limits previously discussed are retained, 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, 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, and 5*, are adequate to ensure the minimum suction piping temperature is maintained.

In summary, the proposed changes to SURVEILLANCE REQUIREMENTS 4.1.5.a.1, 2 and 3 represent either a restatement of existing requirements, a restriction on already acceptable operating space or an additional control.

2. SURVEILLANCE REQUIREMENT 4.1.5.b.3

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.

Revised Specification 4.1.5.b.3 is equivalent to the existing Specification. In the revised Specification 4.1.5.b.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 "Normal Operation" region on the figure. Verifying the solution concentration/volume is in the "Normal Operation" region of FIGURE 3.1.5-2 ensures the design minimum sodium pentaborate is available.

The temperature indicated in footnote "*" to SURVEILLANCE REQUIREMENT 4.1.5.b.3 is 75°F. This limit is based upon the saturation temperature of the solution and an additional 5°F margin as described previously under item C.1.

3. SURVEILLANCE REQUIREMENT 4.1.5.d.3

The '**' footnote to SURVEILLANCE REQUIREMENT 4.1.5.d.3 is reworded to require testing when the pump suction piping is determined to be less than 75°F. The temperature limit is based upon the saturation temperature of the solution and an additional 5°F margin as described previously. The elimination of heat tracing operability from the footnote reflects the design of the SLCS. The heat tracing is provided as a backup heat source to the installation of the equipment in an area in which the air temperature is maintained above the saturation temperature of the solution. The SLCS pump suction piping is provided with two heat tracing circuits for redundancy. The operability of both circuits cannot be readily determined because only one circuit is required to maintain the necessary temperature and the circuit is only energized periodically. Monitoring suction piping temperature once per 24 hours is a more direct and reliable measure which provides assurance that the minimum suction piping temperature is being maintained.

4. FIGURE 3.1.5-1

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.

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 limited operation. The SLCS solution minimum temperature limit is determined by adding the 5°F temperature margin discussed in C.1 above to the saturation temperature for the corresponding saturation concentration.

Proposed FIGURE 3.1.5-1 is in all respects equal to or more restrictive than the existing FIGURE 3.1.5-1.

5. FIGURE 3.1.5-2

In proposed FIGURE 3.1.5-2 which is based on a nominal 90°F solution temperature, the required solution concentration and available volume is defined within a trapezoidal region on the figure. This region corresponds to the "Normal Operation" region of proposed FIGURE 3.1.5-1. 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. At every acceptable concentration and volume point in FIGURE 3.1.5-2, this design minimum weight of sodium pentaborate is available.

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.

Through proposed FIGURE 3.1.5-2 and ACTION 3.1.5.a.3 (discussed below) GGNS is proposing an additional limitation on sodium pentaborate concentration which is not required by the present TS. It is therefore important to emphasize that concentrations in excess of 15.2 weight percent which still remain in the "Limited Operation" region of proposed FIGURE 3.1.5-1 do not represent unsafe operation. GGNS has only proposed this additional restriction in order to provide a convenient tool for operators to increase the frequency of sodium pentaborate concentration surveillance to provide additional assurance that concentrations remain within the acceptable bounds of existing FIGURE 3.1.5-1.

6. ACTION 3.1.5.a.3

ACTION 3.1.5.a.3 is proposed to specify those prudent measures to be taken if the sodium pentaborate concentration exceeds the "Normal Operation" limit of FIGURE 3.1.5-2 during OPERATIONAL CONDITIONS 1 or 2. The proposed ACTION 3.1.5.a.3 would permit 72 hours to restore the sodium pentaborate concentration to within "Normal Operation" limits. The 72 hour restoration time will be allowed because 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 of Figure 3.1.5-2. The proposed ACTION will require verification of being in the limited operation region of Figure 3.1.5-1 once per 4 hours.

With the conditions of proposed ACTION 3.1.5.a.3 met, 72 hours will be permitted to restore the sodium pentaborate solution to within the "Normal Operation" regions of proposed FIGURES 3.1.5-1 and 3.1.5-2. The 72 hour time period is arbitrary and, based on the existing TS, may be infinite with no safety consequences. It was chosen 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 24 hours to once per 4 hours as a prudent measure to ensure the SLCS solution temperature/concentration remains within the bounds of existing FIGURE 3.1.5-1.

If the conditions of proposed ACTION 3.1.5.a.3 are not met (e.g., solution temperature less than SLCS solution minimum temperature limit for the measured concentration), both SLCS subsystems must be declared inoperable and the plant must be in at least HOT SHUTDOWN within the next 12 hours which is consistent with current ACTION 3.1.5.a.2.

7. BASES

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. A statement is also added concerning operation in the "Limited Operation" region of Figure 3.1.5-1.

D. **NO SIGNIFICANT HAZARDS CONSIDERATIONS**

Entergy Operations, Inc. is proposing with this amendment request a revision to TS 3/4.1.5 which would:

- 1) Add an additional ACTION to specify remedial measures to be taken when the SLCS sodium pentaborate solution concentration is outside normal operation limits.
- 2) Provide a more restrictive operating band on the SLCS storage tank sodium pentaborate solution concentration.

The aforementioned revisions are enhancements and improvements which are the result of a self-initiated Safety System Functional Assessment performed for the SLCS. The proposed TS changes result in equivalent or more restrictive operating conditions for the SLCS.

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.

Entergy Operations, Inc. has evaluated the no significant hazards considerations in its request for a license amendment. In accordance with 10CFR50.91(a), Entergy Operations, Inc. 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). The proposed changes represent a restatement of existing requirements, a restriction on already acceptable operating space, or an additional control. Therefore, the probability of an unmitigated ATWS remains unchanged or decreases through implementation of the proposed amendment.
 - b. 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.
 - c. 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 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 involve a constant or increased margin of safety.

The Commission has provided guidance for determining whether a significant hazards exists by providing certain examples of amendments considered not likely to involve significant hazards considerations. One example concerns a change that constitutes an additional limitation, restriction, or control not presently included in the Technical Specifications (i.e., a more stringent surveillance requirement).

In this case, the proposed changes represent an additional limitation in sodium pentaborate concentration operating space as well as increased surveillance frequencies under certain conditions of relatively high sodium pentaborate concentration. The additional limitations and controls are required by neither Technical Specifications nor analysis. Rather, they are proposed as an enhancement by GGNS and therefore are similar to the example cited as not likely to involve a significant hazards consideration.

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