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August 6, 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
Alternate Decay Heat Removal System
and LPCI Manual Realignment
Proposed Amendment to the Operating
License (PCOL-90/03 Revision 2)
AECM-90/0135

Entergy Operations, Inc. - Grand Gulf Nuclear Station (GGNS) is submitting by this letter a revision to the proposed amendment to the GGNS Operating License (OL) previously submitted April 27, 1990 (AECM-90/0056) and resubmitted July 5, 1990 (AECM-90/0111). The proposed amendment requested changes to the GGNS Technical Specifications (TS) due to the addition of the Alternate Decay Heat Removal System (ADHRS). In addition, TS changes were proposed to address the Staff concern regarding manual realignment of low pressure coolant injection emergency core cooling subsystems during plant shutdown. The Staff concern was identified in the Safety Evaluations for OL Amendments 58 and 59 dated March 16, 1989 and March 27, 1989, respectively.

A telephone conference was held on July 16, 1990 in which the Staff provided feedback to Entergy Operations - GGNS on the July 5, 1990 resubmittal. The Attachments of AECM-90/0111 have been revised to reflect incorporation of the Staff's feedback and are attached.

Attachment 2 provides the responses to the Staff's feedback received July 16, 1990.

Attachment 3 provides the technical justification and discussion to support the requested amendment.

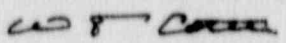
Attachment 4 provides Entergy Operations - GGNS resolutions for the two potential adverse ADHRS system interactions identified in the Safety Evaluations for OL Amendments 58 and 59.

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.

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

The use of the ADHRS is required in order to support the upcoming fourth refueling outage (RF04) at GGNS. As now scheduled, RF04 is to begin approximately October 1, 1990. In order to support the current outage schedule, Entergy Operations - GGNS requests that the NRC complete its review of the proposed TS amendment by no later than September 24, 1990 to allow sufficient time for implementation of the TS amendment prior to RF04.

Yours truly,



WTC:tkm
Attachments:
1. Affirmation per 10CFR50.30
2. Responses to NRC Staff Feedback on AECM-90/0111
3. GGNS PCOL-90/03
4. Resolutions of Potential ADHRS Adverse System Interactions

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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
and
ENTERGY OPERATIONS, INC.

AFFIRMATION

I, W. T Cottle, being duly sworn, state that I am Vice President, Operations - Grand Gulf Nuclear Station 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 Lic of the Grand Gulf Nuclear Station; that I signed this application as Vice sident, Operations - Grand Gulf Nuclear Station 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

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 6th day of August, 1990.

(SEAL)

Elizabeth L. Lang
Notary Public

My commission expires:

December 29, 1991

A9007231/SNLICFLR - 4

Responses to NRC Staff Feedback on AECM-90/0111

On July 16, 1990 the NRC Staff provided feedback to Entergy Operations - GGNS concerning letter AECM-90/0111, "Alternate Decay Heat Removal System and LPCI Manual Realignment, PCOL-90/03 Revision 2", dated July 5, 1990. The following are the Entergy Operations - GGNS responses to the Staff's July 16, 1990 feedback.

Staff Feedback No. 1

GGNS has changed the definition of the Residual Heat Removal (RHR) system shutdown cooling mode from returning reactor coolant via the feedwater system to include return through the low pressure coolant injection (LPCI) injection line. The Staff questioned whether the necessary mechanical assessments had been made regarding flow induced loads on reactor vessel internals, such as control rods and in-core instrumentation since the July 5, 1990 submittal mentions only flow deflectors, thermal shields and nozzles.

Entergy Operations - GGNS Response No. 1

Entergy Operations - GGNS has included additional information concerning flow induced effects on control rods and in-core instrumentation in Attachment 3 of this submittal, Section C.6, the last paragraph.

Staff Feedback No. 2

An OPERABLE Alternate Decay Heat Removal System (ADHRS) should consist of two pumps and two heat exchangers. The proposed Bases for Technical Specifications (TS) 3/4.4.9 and 3/4.9.11 would allow either two or one of each depending upon the level of reactor decay heat present. The Staff asked how does the operator know how many ADHRS pumps and heat exchangers are required to be OPERABLE?

Entergy Operations - GGNS RESPONSE No. 2

The proposed change to the Bases for TS 3/4.4.9 has been withdrawn in response to Staff Feedback No. 6. As shown in Attachment 3 of this submittal, the proposed Bases for TS 3/4.9.11 has been modified to require two ADHRS pumps and exchangers be OPERABLE whenever operating the ADHRS in the reactor cooling mode.

Staff Feedback No. 3

Proposed footnotes (q) and (d) for TS 3/4.3.2 narrowly limit the applicability of the operability requirements on the E12-F008 and E12-F009 valves to only when RHR or ADHRS are aligned to the shutdown cooling common suction line and are removing coolant from the reactor vessel. The Staff said the applicability should be broadened to include anytime a flowpath exists or the systems are aligned and not just when there is flow.

Entergy Operations - GGNS Response No. 3

See Entergy Operations - GGNS Response No. 5.

Staff Feedback No. 4

Concerning the proposed changes to TS 3.6.4, why is it necessary to reference TS 3.3.2? Should not the operator take the action specified in TS 3.6.4 when either of the valves, E12-F008 or E12-F009, are inoperable?

Entergy Operations - GGNS Response No. 4

The proposed "***" footnote was added to TS 3.6.4 to allow the operator to have an option to either isolate the shutdown cooling common suction line or to establish Secondary Containment Integrity, both of which are the actions specified in proposed TS 3.3.2. TS 3.6.4 without the proposed change would require isolation of the affected containment penetration which may not be appropriate if that action would isolate the only flowpath for shutdown cooling. Therefore, the proposed "***" footnote is necessary.

Staff Feedback No. 5

The Staff asked GGNS to consider having the E12-F008 and E12-F009 valves OPERABLE along with their associated instrumentation at all times in Operational Conditions (OC) 4 and 5.

Entergy Operations - GGNS Response No. 5

The applicability for the valves E12-F008 and E12-F009 and their associated isolation instrumentation has been modified to include all times in OCs 4 and 5. In addition, proposed Action 31 of TS Table 3.3.2-1 has been revised to specify isolation of the shutdown cooling common suction line within one hour is an acceptable remedial measure if the Limiting Condition for Operation (LCO) is not met. The proposed revision to Action 31 would allow isolation of the affected line if another flowpath existed to remove reactor coolant for decay heat removal purposes and the common suction line was not needed. The above modifications are reflected in Attachment 3 of this submittal.

Staff Feedback No. 6

The Staff determined the proposed "***" footnote for TS 3.4.9.2 serves no purpose. It is obvious that the ADHRS can be used as an alternate, the same as the Reactor Water Cleanup system or some other system. Therefore, the proposed "***" footnote should be deleted.

Entergy Operations - GGNS Response No. 6

The proposed "***" footnote for TS 3.4.9.2 has been withdrawn as well as the proposed Bases Change for TS 3/4.4.9 since the ADHRS will not be discussed in TS 3.4.9.2. Attachment 3 of this submittal reflects the above withdrawals.

Staff Feedback No. 7

The reference to the ADHRS in the proposed Insert 1 for TS 3.9.11.2 should be revised to specifically define the mode of ADHRS to be used.

Entergy Operations - GGNS Response No. 7

As shown in Attachment 3 of this submittal, proposed Insert 1 to TS 3.9.11.2 has been revised to specifically require that the ADHRS reactor cooling mode be used to meet the LCO.

STAFF FEEDBACK NO. 8

Because the effectiveness of coolant circulation when returning coolant via the LPCI injection line is in question, the proposed reference to the ADHRS in TS 3.9.11.2 Action b may not be appropriate.

Entergy Operations - GGNS Response No. 8

See Entergy Operations - GGNS Response No. 13 for discussion concerning the effectiveness of coolant circulation when returning coolant via the LPCI injection line. The proposed reference to the ADHRS in TS 3.9.11.2 Action b has been celeted however to make Action b of TS 3.9.11.1 and 3.9.11.2 consistent.

Staff Feedback No. 9

The Staff noted the placement of ADHRS in the LCO description of TS 3.9.11.1 does not seem to be appropriate. Why was not the same format of proposed TS 3.9.11.2 used?

Entergy Operations - GGNS Response No. 9

The format of the proposed LCO for TS 3.9.11.1 was chosen to be consistent with the format of TS 3.4.9.2 which also allows a substitute coolant circulation method. Proposed TS 3.9.11.1 is also different from proposed TS 3.9.11.2 because proposed TS 3.9.11.1 still requires one RHR shutdown cooling system to be OPERABLE. Proposed TS 3.9.11.2 will allow the ADHRS reactor cooling mode to substitute for one of the two currently required RHR shutdown cooling systems. Therefore, the proposed format of TS 3.9.11.1 is appropriate.

Staff Feedback No. 10

The Staff asked if the surveillance for TS 3.9.11.1 should include a reference to the ADHRS since the ADHRS is part of the proposed LCO.

Entergy Operations - GGNS Response No. 10

TS 4.9.11.1 and the "*" footnote have been modified to include the ADHRS and are shown in Attachment 3 of this submittal.

Staff Feedback No. 11

The Staff asked if the check valve isolating the ADHRS discharge line from the LPCI "C" injection line should be included in the TS since it isolates the reactor pressure vessel from the ADHRS.

Entergy Operations - GGNS Response No. 11

The subject check valve (E12-F416) does serve an isolation function for the interface of the ADHRS with LPCI "C", but E12-F416 is not a reactor coolant pressure boundary (RCPB) valve. The valves E12-F041C and E12-F042C which are downstream of the E12-F416 and are closer to the reactor pressure vessel in the LPCI "C" injection line serve as the RCPB valves. The E12-F416 is inspected as part of the ASME Section XI inservice testing program. Because the valve, E12-F416, is not an RCPB isolation valve, it would be inappropriate and inconsistent to place the valve in TS 3.4.3.2.

Staff Feedback No. 12

Section C.23 of Attachment 2 in the July 5, 1990 submittal discusses that administrative controls are used to preclude simultaneous operation of the ADHRS with various systems. The Staff questioned whether similar prohibitions should be added to the appropriate TS.

Entergy Operations - GGNS Response No. 12

The inclusion of the simultaneous operation prohibitions in the TS is not consistent with the content of current TS or of the improved TS. However, the proposed Bases for TS 3/4.5.1, 3/4.5.2 and 3/4.9.11 have been revised to include prohibitions against the simultaneous operation of the ADHRS with LPCI "C" and the RHR loops "A" and "B" for shutdown cooling (for certain alignments). The existing plant procedures will also continue to contain the prohibitions against the operators simultaneously using the ADHRS with LPCI "C" and the RHR loops "A" and "B" for shutdown cooling (for certain alignments). The proposed Bases changes are included with Attachment 3 of this submittal.

Staff Feedback No. 13

Using TS 3.4.9.2 as an example, the Staff stated the LCO addresses two different functions, namely, decay heat removal and reactor coolant circulation. With shutdown cooling return flow through a LPCI injection line, the Staff asked if the mixing is effective enough, when compared to return flow through the feedwater system, to prevent exceeding the OC 4 TS coolant temperature limit and inadvertently pressurizing the reactor? Also, in relation to the concern of pressurization, the Staff asked if the coolant temperature monitoring provides representative temperature measurements so that the operator will realize that coolant temperature inside the reactor is increasing (i.e., inadvertent pressurization)? The Staff said their main concern was right after shutdown in OCs 4 and 5 while the reactor pressure vessel head was still in place.

Entergy Operations - GGNS Response No. 13

Entergy Operations-GGNS will respond in a separate submittal to the Staff's feedback by August 9, 1990.

Staff Feedback No. 14

The proposed Insert 2 to TS 3/4.5.1 should be clarified to state that one of the two required ECCS may require manual realignment. The currently proposed wording of the "#" footnote is unclear as to the meaning of the word "capable".

Entergy Operations - GGNS Response No. 14

The proposed Insert 2 to TS 3/4.5 2 has been revised to incorporate the Staff's feedback and is included in Attachment 3 to this submittal.

A. SUBJECT

1. NL-90/02 Alternate Decay Heat Removal System and LPCI Manual Realignment

2. Affected Technical Specifications:

   a. Isolation Actuation Instrumentation, Table 3.3.2-1 - Pages 3/4 3-13, 3/4 3-14 and 3/4 3-15

   b. Isolation Actuation Instrumentation Surveillance Requirements, Table 4.3.2.1-1 - Page 3/4 3-25

   c. Residual Heat Removal - Cold Shutdown, 3/4.4.9.2 - Page 3/4 4-27

   d. ECCS - Shutdown, 3.5.2 - Page 3/4 5-6

   e. Containment and Drywell Isolation Valves, 3.6.4 - Page 3/4 6-28

   f. Residual Heat Removal and Coolant Circulation - High Water Level, 3/4.9.11.1 - Page 3/4 9-18

   g. Residual Heat Removal and Coolant Circulation - Low Water Level, 3/4.9.11.2 - Page 3/4 9-19

   h. Bases 3/4.5.1 and 3/4.5.2 and 3/4.9.11 - Pages B 3/4 5-2 and B 3/4 9-2.

B. DISCUSSION

1. Entergy Operations, Inc. - Grand Gulf Nuclear Station (GGNS) proposes the GGNS Technical Specifications (TS) and Bases be revised on a permanent basis to permit use of the Alternate Decay Heat Removal System (ADHRS) during future GGNS outages. In addition, TS and Bases changes are proposed to address NRC Staff concerns regarding the operation of Emergency Core Cooling System (ECCS) subsystems and Residual Heat Removal (RHR) system shutdown cooling loops.

2. During outages, the RHR shutdown cooling mode of operation is normally used to provide core cooling at GGNS. In this mode of operation, reactor coolant is pumped from the "B" recirculation loop through a common suction line to either the RHR system "A" or "B" pump and then on to the respective RHR heat exchanger to be cooled by the Standby Service Water System. The reactor coolant is returned to the vessel via the upper containment pool, either "A" or "B" feedwater lines or either "A" or "B" low pressure coolant injection (LPCI) lines (depending on which RHR shutdown cooling loop is being used). The operation of RHR shutdown cooling during Operational Conditions (OCs) 4 and 5 is controlled by TS 3.4.9.2, 3.9.11.1 or 3.9.11.2.

In accordance with the present GGNS TS, an alternate method of decay heat removal must be demonstrated operable for each required loop of RHR shutdown cooling that is inoperable. Prior to the third refueling outage (RF03), reactor water cleanup (RWCU), control rod drive (CRD), fuel pool cooling and cleanup (FPCCU) or other systems were used in various combinations for alternate decay heat removal. Because of the relatively limited decay heat removal capability of these systems, their use as alternate decay heat removal systems is restricted to time periods when decay heat loads are substantially reduced.

During each refueling outage, one or both loops of the RHR shutdown cooling systems must be removed from service in order to perform required surveillances and/or routine maintenance. In addition, required surveillances and/or maintenance activities on either Division I or II RHR system components or supporting system components can require that either RHR shutdown cooling "A" or "B" loops be declared inoperable.

It is the intent of Entergy Operations - GGNS to conduct and manage all outages in a safe and prudent manner. It is also Entergy Operations - GGNS goal to maximize plant availability by scheduling refueling outages such that the critical path is controlled by refueling activities and mandatory safety issues. With that goal in mind Entergy Operations - GGNS established a generic refueling outage goal of not more than 46 days. In order to support the 46 day outage goal, Entergy Operations - GGNS identified the need for an improved alternate decay heat removal method for OCs 4 and 5. Entergy Operations - GGNS evaluated alternatives and selected as the best alternative the addition of a new system, the ADHRS.

Without ADHRS, it is estimated that future outages at GGNS would be unnecessarily extended. Lowering of the reactor cavity water level could not occur until outage day 38. Thus, the schedule for reactor vessel reassembly work would be impacted. The net effect would be an extension of the schedule for refueling floor activities by approximately 14 days.

Entergy Operations - GGNS designed and installed the ADHRS for use beginning with the third GGNS refueling outage to supplement the decay heat removal capability of the RHR system during OC 4 and OC 5.

The design objectives of the ADHRS were to provide available alternate decay heat removal capacity by the end of outage day 1 and to be as independent as possible from other plant systems. The ADHRS was designed to meet certain design criteria including the following:

a. Maintain TS average reactor coolant temperature limits

   i. $\leq$ 200°F during OC 4

   ii. $\leq$ 140°F during OC 5

b. Operate in OCs 4 and 5 only

c. Provide capability to isolate the system in OCs 1, 2 and 3

d. Provide no safety function related to

   i. shutdown capability

   ii. accident mitigation

e. Create no adverse interaction with existing plant systems

f. Provide a pressure boundary

   i. ASME Section III, Class 3

   ii. Seismic Category I

g. Provide the capability for operation from the control room.

The ADHRS uses a combination of existing plant systems and ADHRS specific piping and valves to establish flowpaths for the various ADHRS modes as described below. The ADHRS equipment is located in the RHR "C" pump room. Functional control from the control room is provided. Plant Service Water (PSW) provides cooling water to the ADHRS heat exchangers.

The ADHRS is designed to operate in OC 4 (Cold Shutdown) and OC 5 (Refueling). During OCs 1, 2, and 3, ADHRS is isolated by locked closed or deenergized valves from connected plant systems. The ADHRS can be operated in different modes as follows:

a. Suppression pool to suppression pool flush/test mode: From the suppression pool suction line, the suppression pool water is pumped through the ADHRS pump(s), heat exchanger(s), flow control valve and back to the suppression pool via the RHR "C" full flow test return line.

b. Reactor cooling mode via RHR "A" or "B": Using the existing RHR shutdown cooling common suction line, reactor coolant is pumped from the reactor coolant "B" recirculation loop through valves E12-F006A and E12-F066A (RHR "A" loop) or valves E12-F006B and E12-F066B (RHR "B" loop) to the ADHRS pumps, then to the heat exchangers and back to the reactor vessel via RHR "C" LPCI injection line.

c. Reactor cooling mode via the spent fuel pool: Coolant is pumped from the spent fuel pool through the ADHRS and back to the reactor vessel through the RHR "C" LPCI injection line. Operation in this mode is applicable only to OC 5 when the reactor cavity is flooded. This mode provides an ADHRS reactor cooling flow path and allows the shutdown cooling common suction line to be taken out of service for maintenance.

During operation, the ADHRS flow and cooling rate are controlled by a flow control valve operated from the main control room. System performance is monitored in the main control room by use of RHR "C" flow indication and common ADHRS heat exchanger inlet and outlet temperature indication. System status is monitored in the main control room by position indication for valves E12-F066A and B and the flow control valve, ADHRS pump running status lights, and position indication for various motor-operated valves in the ADHRS flow path.

The functional purpose of the ADHRS is not safety related, since the ADHRS does not automatically mitigate the consequences resulting from accidents. However, safety-related components are used in various portions of the ADHRS to ensure that current safety-related requirements of the ECCS and RHR system are not compromised by the installation or use of the ADHRS.

By letter dated September 23, 1988 (AECM-88/0186), as revised November 30, 1988 (AECM-88/0236), December 16, 1988 (AECM-88/0246) and December 21, 1988 (AECM-88/0252), Entergy Operations - GGNS provided detailed ADHRS design, system interaction, and operation information and requested an amendment to the GGNS Operating License. The proposed amendment requested changes to the GGNS TS due to the addition of the ADHRS. By letters dated February 6, 1989 (AECM-89/0028), February 23, 1989 (AECM-89/0042), March 6, 1989 (AECM-89/0052) and March 8, 1989 (AECM-89/0053), Entergy Operations - GGNS provided additional information regarding the ADHRS design, earlier submitted safety analyses and limitations on ADHRS use.

Based upon the information Entergy Operations - GGNS provided, the NRC approved in GGNS Operating License (OL) Amendment 59 a one-time use of the ADHRS during RF03. For long term use of the ADHRS (i.e., after RF03), the NRC determined that additional TS should be considered for operation of ECCS subsystems and shutdown cooling loops, including the ADHRS.

3. An additional concern was identified by the NRC Staff during review of the amendment requesting TS 3.0.4 one-time exceptions for RF03 submitted in AECM-89/0038 dated February 20, 1989. TS 3.5.2 provides the ECCS operability requirements for OCs 4 and 5. The Limiting Condition for Operation (LCO) for TS 3.5.2 contains a provision allowing the LPCI "A", "B" and "C" subsystems of the RHR system to be considered operable with a flow path capable of taking suction from the suppression pool upon being manually realigned. This allows, for example, an RHR subsystem to be aligned and operated as a shutdown cooling loop and, provided a suppression pool suction flow path exists, still be considered an operable LPCI subsystem satisfying the LCO requirements of TS 3.5.2. The NRC was concerned that, if two manually initiated ECCS subsystems were allowed to be operable to meet the LCO, an inadvertent drainage event may result in uncovering a portion of the reactor core.

For RF03, the NRC Staff requested that Entergy Operations - GGNS require at least one of the two required operable ECCS in OCs 4 and 5 to be capable of automatic initiation and injection upon receipt of a low reactor water level signal.

Entergy Operations - GGNS reviewed the licensing and safety basis for TS 3.5.2; and, as the NRC Staff requested, committed in letter AECM-89/0052 dated March 6, 1989 to implement administrative controls in the form of a Technical Specification Position Statement (TSPS) to require, for RF03, that required in part:

a. at least one of the two ECCS required operable by TS 3.5.2 be capable of automatic initiation and injection to the reactor vessel; and

b. if TS 3.5.2 requires operable ECCS subsystems and no automatic initiation/injection ECCS is operable then operations with the potential for draining the reactor vessel be suspended immediately.

The above administrative controls were proposed by Entergy Operations - GGNS for the short term until the necessary evaluation to determine adequate long term TS controls could be completed. As documented in the OL Amendment 58 Safety Evaluation dated March 16, 1989, the NRC found the short term administrative controls acceptable.

4. Therefore, in order to permit long term use of the ADHRS during future outages and to resolve the issue of LPCI manual realignment during OCs 4 and 5, the following TS changes are proposed:

a. The reactor vessel water level-low, level 3 RHR system isolation trip function of Table 3.3.2-1 is revised to require the operability of the trip function during OCs 4 and 5. A note (p) is added specifying the trip function is only required to isolate RHR system isolation valves E12-F008 and E12-F009. In addition, note (p) specifies one trip system and/or isolation valve maybe inoperable for up to 14 days without placing the trip system in the tripped condition provided the diesel generator associated with the operable isolation valve is operable. Also, Action 31 is added to specify the measures to be taken if the trip function or the isolation valves become inoperable during OCs 4 and 5.

b. Table 4.3.2.1-1 is revised to require surveillance testing of the reactor vessel water level-low, level 3 RHR system isolation trip function in OCs 4 and 5 consistent with the proposed change to Table 3.3.2-1.

c. The LCO of TS 3/4.4.9.2 is revised by means of a footnote which requires one of the two required operable RHR shutdown cooling mode loops to have an operable associated diesel generator. In addition, previous TS changes granted applicable only for RF03 are deleted.

d. TS 3.5.2 is revised by removing the manual realignment provisions for the LPCI subsystems and adding a note to the LCO which allows one of the two required ECCS subsystems/systems to require manual realignment. Action a is modified to specify that operations that have a potential for draining the reactor vessel be suspended if the automatic ECCS subsystem/system required by the LCO is inoperable. Also, previous TS changes granted applicable only for RF03 are deleted.

e. The Action of TS 3.6.4 is revised to provide remedial measures if the required automatic isolation valves, E12-F008 and E12-F009, become inoperable in OCs 4 and 5. Previous TS changes granted applicable only for RF03 are deleted.

f. The LCO and Surveillance Requirement of TS 3/4.9.11.1 are revised to recognize the ADHRS as an acceptable alternate method for the required RHR shutdown cooling mode train being in operation provided one RHR shutdown cooling mode train is operable. A footnote is added specifying that, when the LCO is applicable, one RHR shutdown cooling mode train must have an operable associated diesel generator. In addition, previous TS changes approved applicable only for RF03 are deleted.

g. The LCO and Surveillance Requirement of TS 3/4.9.11.2 are revised to recognize the ADHRS reactor cooling mode as an acceptable substitute for one of the two required RHR shutdown cooling mode trains provided the remaining RHR shutdown cooling mode train and its associated diesel generator are operable. A footnote is added specifying that, when the LCO is applicable, one RHR shutdown cooling mode train must have an operable associated diesel generator. Action a is revised to require either water level be raised or all operations involving an increase in the reactor decay heat load be suspended and within one hour action to establish Secondary Containment Integrity be initiated when the LCO is not met. Also, previously approved TS changes applicable only for RF03 are deleted.

h. The Bases associated with TS 3/4.5.2, 3/4.9.11.1 and 3/4.9.11.2 are revised to reflect the changes to the TS described above.

Attached are the affected TS and Bases pages marked to show the proposed revisions. The TS changes due to the ADHRS installation approved by the NRC in OL Amendment 59 dated March 27, 1989 which added a PSW radiation monitor to TS 3/4.3.7.1 and added two valves to TS 3/4.8.4.2 are also attached for information. Changes to TS 3/4.3.7.1 and TS 3/4.8.4.2 are not being proposed as part of this amendment request since the TS changes approved in OL Amendment 59 to these two TS are still valid and applicable.

C. JUSTIFICATION

1. As discussed in Section B above, the ADHRS was previously licensed in OL Amendment 59 for use during RF03 only. For RF03, Entergy Operations - GGNS committed in the various letters referenced in Section B to implement administrative controls to clarify the operability requirements of systems which provide decay heat removal (including ADHRS), and for the automatic isolation of the reactor vessel in the event of inadvertent drainage of reactor coolant from the vessel and automatic injection of water into the reactor vessel by ECCS pumps. The NRC found these administrative controls acceptable for one time licensing of the ADHRS. However, for long term licensing of the ADHRS, the NRC determined, as documented in the OL Amendment 59 Safety Evaluation dated March 27, 1989, that Entergy Operations - GGNS must evaluate TS changes needed to implement the above administrative controls. In addition Entergy Operations - GGNS identified, in AECM-89/0051 dated March 3, 1989, two potential adverse system interactions created by the operation of the ADHRS. In the OL Amendment 59 Safety Evaluation, the NRC required resolution of these potential adverse system interactions prior to long term licensing of the ADHRS. The resolution of each condition the NRC placed on long term ADHRS use is addressed below.

Decay Heat Removal System Requirements (TS 3/4.4.9.2, 3/4.9.11.1 and 3/4.9.11.2)

2. The first condition related to long term ADHRS use the NRC identified was the TS needed to clarify the operability requirements of systems which provide decay heat removal. During NRC review of the ADHRS, as summarized in the OL Amendment 59 Safety Evaluation, the Staff expressed concern that the TS present at the time did not adequately limit the conditions for long term use of the ADHRS as a supplemental decay heat removal system. Unlike the RHR loops, the ADHRS is not a safety-related system, cannot be powered by an onsite diesel generator, and uses PSW as the cooling water for the heat exchangers; therefore, the NRC concluded that additional TS limits were needed for long term ADHRS use.

3. In response to the NRC Staff concern, Entergy Operations - GGNS committed for the short term to limit the use of ADHRS to RF03 and to provide administrative controls on requirements for its use. Entergy Operations - GGNS also committed to evaluate TS changes needed to implement these requirements for the long term use of the ADHRS. Thus, for RF03, a note was added to TS 3.4.9.2, TS 3.9.11.1 and TS 3.9.11.2 which limited use of the ADHRS to RF03.

TS 3.4.9.2, 3.9.11.1, and 3.9.11.2 establish the RHR shutdown cooling requirements while in OCs 4 and 5. In accordance with these requirements, Entergy Operations - GGNS must maintain operable either one or two loops of RHR shutdown cooling while in OCs 4 and 5. With less than the required number of RHR shutdown cooling loops, appropriate action in accordance with the TS action statements must be taken. Each of these TS recognizes the use of an alternate decay heat removal method as an acceptable approach in complying with the action statements.

With regard to RHR requirements, and in order to consider ADHRS as part of the decay heat removal means during RF03, Entergy Operations - GGNS implemented administrative controls in the form of a TSPS that provided requirements as follows:

a. For TS 3.9.11.2 (OC 5 with a low water level) and TS 3.4.9.2 (OC 4), one operable and one operating shutdown cooling system:

   i. In the event that a loss of offsite power occurs, one of the systems shall be capable of removing decay heat (i.e., powered by an onsite power source). No additional failure (beyond the loss of offsite power) is assumed in this case.

   ii. In the event of the loss of one of the operating systems, the operable system shall be placed in service for decay heat removal. Relevant action statements of the TS shall also be used.

   iii. In the event of a loss of offsite power and the loss of the operating shutdown cooling system (either ADHRS or RHR), an ECCS system shall be operable and capable of being powered with its associated onsite power supply.

b. For TS 3.9.11.1 (OC 5 with a high water level), only one operating shutdown system is required. When the ADHRS is being used to fulfill the requirements of an alternate, as described in TS 3.9.11.1, Action a, an RHR system shall be available as a backup and capable of accommodating a loss of offsite power (i.e., can be powered by an onsite power supply).

Entergy Operations - GGNS committed to evaluate incorporation of the TSPS requirements into the TS for the long term licensing of the ADHRS.

The NRC evaluated the above TSPS requirements and found that the existing safety margin of the TS for the RHR systems did not significantly decrease with implementation of the TSPS requirements. Therefore, for the short term, the Staff concluded that addition of the ADHRS as one of the decay heat systems was acceptable for RF03, using these requirements.

4. The proposed changes to TS 3/4.4.9.2, 3/4.9.11.1 and 3/4.9.11.2 contained in this submittal reflect the results of the evaluation conducted.

   The LCO of TS 3/4.9.11.1 and 3/4.9.11.2 have been changed to allow the use of the ADHRS in lieu of an RHR shutdown cooling loop in OC 5. The modification of the LCOs will permit ADHRS use without requiring entry into the Action statements of the applicable TS.

   The LCOs of TS 3/4.4.9.2, 3/4.9.11.1 and 3/4.9.11.2 have also been modified to require, when the LCO is applicable, one operable RHR shutdown cooling mode train must have an operable associated diesel generator.

   When the plant is in OC 4 or OC 5 with a low reactor cavity water level, the current TS require two operable ECCS subsystems/systems, two operable RHR shutdown cooling loops and one operable diesel generator (DG) (the Division III DG is also required when the high pressure core spray system (HPCS) is operable). The required DG is capable of powering one of the two required RHR shutdown cooling loops and either the Division I or the Division II ECCS subsystems. Division I DG can power low pressure core spray (LPCS), LPCI "A" and RHR "A". Division II DG can power LPCI "B", LPCI "C" and RHR "B". ADHRS will also be used as a method capable of decay heat removal in accordance with the proposed TS.

   When the plant is in OC 5 with a high reactor cavity water level, the current TS require one operable RHR shutdown cooling loop. The proposed TS will permit the operation of ADHRS in lieu of an RHR shutdown cooling loop provided one RHR shutdown cooling loop is operable.

5. The proposed changes to TS 3/4.4.9.2, 3/4.9.11.1 and 3/4.9.11.2 are more restrictive than the current TS with respect to the requirements governing the methods of decay heat removal. In order to use ADHRS, proposed TS 3/4.9.11.1 and 3/4.9.11.2 will require a backup method of decay heat removal.

   When the plant is in OCs 4 or 5 with the requirements of TS 3.4.9.2 or TS 3.9.11.2 applicable (i.e., two RHR shutdown cooling loops and one DG operable) only one of the two required operable RHR shutdown cooling loops will be associated with an operable DG. If a failure in one RHR shutdown cooling loop or a loss of offsite power were to

occur, only one RHR shutdown cooling loop would be left operable. If ADHRS and one RHR shutdown cooling loop along with its associated DG were operable and a loss of one decay heat removal method or a loss of offsite power were to occur a method of removing reactor decay heat would still exist, either the ADHRS or RHR shutdown cooling loop depending on the loss assumed. The proposed TS changes to TS 3/4.4.9.2 and TS 3/4.9.11.2 maintain the same level of safety as the current TS.

TS 3.9.11.2 Action a is revised to require either water level to be raised greater than or equal to 22 feet 8 inches above the top of the reactor pressure vessel flange within 12 hours or suspension of all operations involving an increase in the reactor decay heat load and action to be initiated within one hour to establish Secondary Containment Integrity when it is discovered the system(s) or alternate(s) being used to meet the LCO or Action requirements is(are) inoperable. Raising of the water level will make TS 3.9.11.1 applicable instead of TS 3.9.11.2. If no methods of decay heat removal have been made operable within 4 hours of TS 3.9.11.1 becoming applicable then TS 3.9.11.1 Action a must be satisfied. TS 3.9.11.1 Action a requires suspension of all operations involving an increase in the reactor decay heat load and establishment of Secondary Containment Integrity. The proposed Action a is similar in that Secondary Containment Integrity will be required and operations involving an increase in the reactor decay heat load will be suspended if LCO 3.9.11.2 is not satisfied and water level has not been raised. The one hour requirement to initiate action to establish Secondary Containment Integrity is based upon the fact that Secondary Containment Integrity is not required at all times by the TS in OC 5 with low water level and therefore may require some period of time to establish. The time period is dependent upon the operability status of the various components required for Secondary Containment Integrity. The proposed change to TS 3.9.11.2 Action a therefore will result in the plant being placed in a safer condition.

6. Use of the ADHRS instead of an RHR shutdown cooling mode train, in the context of TS 3/4.9.11.1 and 3/4.9.11.2, required the evaluation of the effects upon three nuclear boiler system parameters: (1) reactor coolant circulation, (2) reactor coolant temperature, and (3) reactor vessel internals integrity.

   The ADHRS is designed to maintain reactor coolant temperature within the limits required by the TS for OC 5. The cooling/ temperature maintenance capacity of the ADHRS is designed for and calculated to be adequate at any time subsequent to 24 hours after reactor shutdown, based on nominal decay heat rates and PSW temperatures and flows.

   The ADHRS is designed for controlling reactor coolant system flow through the ADHRS from 1000 gpm to 3600 gpm. Operation includes throttling of the ADHRS from the control room. A steady-state water temperature of approximately 185°F can be maintained with an ADHRS flowrate of 3600 gpm 24 hours after shutdown.

When ADHRS is operated in the reactor cooling mode, water is routed to the ADHRS pumps using FPCCU piping. RHR "C" discharge piping is used to return the cooled water back to the vessel. The effectiveness of this return flowpath has been evaluated and determined to be as effective as when RHR uses the feedwater system return flowpath.

Recirculation loop temperature is used in determining reactor coolant temperature, but only during the period of time the associated recirculation pump is in operation. At other times, the system that is in operation to provide reactor coolant circulation as required by TS 3.9.11.1 and 3.9.11.2 is used to monitor coolant temperature. ADHRS, RHR, and RWCU all have inlet temperature indications in the control room. Reactor pressure is monitored using the normal wide range reactor vessel pressure recorder. Two wide range post-accident pressure recorders are also available. Reactor level is monitored using shutdown range level instruments. These indicators are all located in the control room.

Analyses have been performed to verify that the return of reactor coolant through the LPCI "A", "B" or "C" injection lines has no adverse effect on the LPCI "A", "B", and "C" nozzles, flow deflectors and thermal shields. The results of the studies show that the increase in usage factor for the flow deflectors, thermal shields and nozzles is negligible and remains below design allowables. Also, ASME Code stress allowables are not exceeded.

In-core components, specifically instrumentation and control rods, were evaluated for adverse flow induced loading due to coolant injection into the core area. This evaluation was based on tests performed by General Electric at the General Electric HF2 test facility. General Electric concluded from the tests that no in-core instrumentation or control rod flow induced damage is expected. As recommended by General Electric, fuel movement in the vicinity of the LPCI "A", "B", and "C" nozzles during their use as reactor coolant return points is limited by administrative controls. The purpose of the administrative controls is to eliminate any adverse flow induced effects upon control rods and in-core instrumentation near the injection nozzles.

7. The operation of the ADHRS can only affect plant safety during OCs 4 or 5 since in all other OCs the ADHRS is required to be physically isolated from other systems. The type of events during OCs 4 and 5 that ADHRS can affect are a loss of decay heat removal and an inadvertent drainage of reactor coolant.

Entergy Operations - GGNS has analyzed, for the worst plant conditions, an event in which ADHRS is in operation during OC 4 and fails and the backup RHR shutdown cooling loop would have to be placed in service. The ADHRS has sufficient heat removal capability to maintain a reactor coolant temperature of 185°F twenty-four hours following reactor shutdown with a decay heat load of approximately 79 million Btu/hr. This conservative decay heat load is calculated in accordance with ASB BTP 9-2 assuming 800 fuel assemblies from an equilibrium core. Assuming the vessel is flooded to one foot below the top of the vessel flange and considering the volume of water in the recirculation loops and main steam lines out to the inboard main steam isolation valves, a mass of about 1.5 million pounds is available to absorb energy from an uncooled core. Further, assuming no credit for metal mass associated with the vessel, fuel, core structures, or piping and taking no credit for any conductive, convective, evaporative, or radiative heat losses, the temperature of the water mass would increase at a maximum rate of about 53°F/hr (i.e., constant decay heat load during the 24-hour period), assuming a complete loss of all cooling. Consequently, if the initial water temperature was 185°F, the water would reach 212°F in just over 30 minutes. In order to minimize the potential to boil following the loss of decay heat removal capability, TS 3/4.9.11.2 is proposed to be changed to require an operable RHR shutdown cooling system serve as a backup to the ADHRS whenever the ADHRS is used. Therefore for a loss of decay heat removal type event, boiling in the reactor core will be prevented even if the ADHRS were being used to satisfy the TS LCO for shutdown cooling.

In addition, GGNS Off-Normal Event Procedure (ONEP) 05-1-01-III-1, "Inadequate Decay Heat Removal," addresses loss of decay heat removal capability in OCs 4 and 5. This procedure provides the operator with specific directions for maintaining or re-establishing adequate core cooling, including references to the appropriate system operating instructions for placing RHR shutdown cooling or alternate methods into service. The procedure also includes provisions for the loss of electrical power, including loss of the DG.

Relative to a loss of reactor coolant caused by inadvertent drainage of the reactor vessel (i.e., a system alignment that allows either gravity or pumped flow from the vessel via an existing isolation point), the ADHRS design, interlocks and accompanying procedural requirements do not increase the probability of this type of event beyond that associated with existing plant systems. In addition, the proposed changes to TS 3/4.3.2 and TS 3.5.2 will lessen the consequences of an inadvertent drainage event even more so than the current TS.

TS for ADHRS Operation During OCs 1, 2 and 3

8. During the NRC review of the ADHRS, the NRC Staff expressed a concern regarding certain TS (e.g., TS 3.7.1.1, Action a.2) applicable to OC 3 and the meaning of footnotes associated with those TS. For example, TS 3.7.1.1 governs the operability requirements of the Standby Service Water (SSW) system. In OCs 1, 2 or 3, TS 3.7.1.1 Action a.2 requires the plant condition to be cold shutdown (OC 4) if both SSW subsystems are inoperable. The ** footnote allows the use of alternate heat removal methods to maintain the reactor coolant temperature as low as practical if unable to attain cold shutdown. This footnote recognizes, with both SSW subsystems inoperable, that TS require the associated systems supported by the SSW subsystems be declared inoperable (i.e., both loops of RHR shutdown cooling). The Staff was concerned that because of the similar terminology utilized in the OC 3 TS an operator may be led to believe that the ADHRS is the appropriate system to be used in that situation. Because the ADHRS is not designed to be operable during OCs 1, 2 and 3, the Staff believed these TS could mislead an operator such that the plant could be placed in an unsafe condition. Entergy Operations - GGNS modified several GGNS procedures to caution against the use of ADHRS in OCs 1, 2 and 3. The NRC concluded the use of a caution was acceptable for RF03. However, the Staff concluded that prior to subsequent use of ADHRS the TS should be changed to preclude the use of ADHRS in OCs 1, 2 and 3.

ONEP 05-1-01-III-1 is the procedure which the operator would use in a situation where both RHR shutdown cooling loops are inoperable and specifies the actions to be taken during such an event. This procedure specifically prohibits the use of the ADHRS in OCs 1, 2 and 3. In addition, the RHR System Operating Instruction (SOI), which includes the instructions for ADHRS use, also specifically prohibits use of the ADHRS in OCs 1, 2 and 3. Operators are trained on the use of TS, ONEPs, and SOIs as part of the licensed operator training and qualification program.

In OCs 1, 2 and 3, ADHRS is isolated mechanically and electrically from connected plant systems. Thus, during this time, the ADHRS is incapable of functioning without the performance of significant operator restoration activities. Operator actions would include such things as closing breakers, unlocking valves and manually realigning valves. These actions would also require the prior knowledge and approval of the on-shift Senior Reactor Operator before ADHRS could be aligned for service.

The ADHRS uses the same suction piping to remove reactor coolant from the vessel as the RHR shutdown cooling loops "A" and "B". This suction piping contains isolation valves E12-F008 and E12-F009 which are interlocked with reactor pressure to prohibit opening whenever reactor pressure is greater than 135 psig. The reactor pressure interlock is governed by TS 3/4.3.2.

Based upon the above, Entergy Operations - GGNS believes the procedures, plant design, current operator knowledge and training make a TS change unnecessary for these TS and footnotes associated with plant operations in OC 1, 2 and 3.

Reactor Vessel Isolation Requirements (TS 3/4.3.2 and 3.6.4)

9. The second condition the NRC identified related to long term ADHRS use was that the TS needed to require the equipment necessary for automatic isolation of the reactor vessel to be operable in the event of inadvertent drainage of reactor coolant from the vessel. During NRC review of the ADHRS, the NRC expressed a concern about the adequacy of the operator response time to prevent core uncovery due to inadvertent reactor vessel drainage through the shutdown cooling common suction line.

10. In response, Entergy Operations - GGNS committed for RF03 to implement administrative controls in the form of a TSPS to require at least one of the valves (E12-F008 or E12-F009) which isolate the reactor vessel from the decay heat removal system to be automatically isolated on a Level 3 (L3) low reactor vessel water level signal during any operation with a potential for draining the reactor vessel. The NRC found these administrative controls acceptable for ADHRS use during RF03 but required the TS be evaluated for possible changes prior to approving long term use of the ADHRS.

11. Entergy Operations - GGNS has evaluated the TS and determined TS 3/4.3.2 and TS 3.6.4 should be revised to reflect the controls implemented in the TSPS. The automatic isolation valves associated with the ADHRS and the RHR shutdown cooling loops are valves E12-F008 and E12-F009. These valves provide a suction path for RHR "A" and "B" shutdown cooling loops and for the ADHRS. They also serve as containment isolation valves and are thus controlled by TS 3/4.6.4. In accordance with current TS 3/4.3.2 and 3/4.6.4, the automatic isolation function of valves E12-F008 and E12-F009 is required only during OCs 1, 2 and 3. The Bases for TS 3/4.6.4 states that the operability of containment isolation valves ensures the containment will be isolated from the outside environment in the event of release of radioactive materials to the containment atmosphere or pressurization of the containment. However, containment integrity is only required during OCs 1, 2 and 3 per TS 3.6.1.1.

The ADHRS or RHR shutdown cooling loops can only be operated during OCs 4 and 5 (except that RHR shutdown cooling can be used in OC 3 when reactor pressure is less than 135 psig). Only when the ADHRS or RHR shutdown cooling loops are operating or not isolated is there a possibility for the shutdown cooling common suction line to be involved in the inadvertent drainage of reactor coolant. Consistent with this configuration, Entergy Operations - GGNS proposes the applicable TS conditions for operability and surveillance of the automatic isolation valves (E12-F008 and E12-F009) in the shutdown cooling common suction line and associated L3 reactor water level isolation instrumentation be changed to include OCs 4 and 5.

The TS 3/4.3.2 setpoint, allowable value, and surveillance frequencies for the L3 reactor water level isolation trip function are not affected by the proposed TS changes. Only the TS applicability is affected by the proposed change. The applicability is extended beyond OCs 1, 2 and 3 to include OCs 4 and 5.

The required Action 31 for TS 3.3.2 and the modified Action statement of TS 3.6.4 being proposed in the event that one of the two L3 trip systems or one of the two isolation valves (E12-F008 or E12-F009) become inoperable requires either the shutdown cooling common suction line be isolated within one hour if it is not needed for shutdown cooling or that action be initiated within one hour to establish Secondary Containment Integrity. Isolation of the shutdown cooling common suction line provides an equivalent level of safety since the line can no longer serve as a drainage path. By requiring Secondary Containment Integrity be established instead of isolating the shutdown cooling common suction line allows continued reactor decay heat removal via either the ADHRS or RHR shutdown cooling. The one hour requirement to initiate action to establish Secondary Containment Integrity is based upon the fact that Secondary Containment Integrity is not required at all times by the TS in OCs 4 and 5 and therefore may require some period of time to establish. The time period is dependent upon the operability status of the various components required for Secondary Containment Integrity. The proposed Action assures that both of the needs, to provide decay heat removal and to mitigate potential drainage events, are satisfied.

In addition, a note (p) is added to TS Table 3.3.2-1 specifying that one trip system of the L3 isolation trip function or one isolation valve may be inoperable for up to 14 days without placing the trip system in the tripped condition provided the diesel generator associated with the remaining operable isolation valve is operable. This proposed change is consistent with the fact that only one isolation valve is necessary to isolate the shutdown cooling suction path which would mitigate the consequences of an inadvertent drainage event (assuming the draindown was through this path). Also, the proposed changes to TS 3.5.2 will provide mitigation of a reactor vessel drainage event regardless of drainage path.

12. The proposed TS changes to TS 3/4.3.2 and TS 3.6.4 impose more restrictive requirements upon plant equipment than do the current TS. The affected equipment is not currently required operable in OCs 4 and 5 but will be required operable by the proposed TS changes.

13. The current TS do not require the L3 isolation trip function or isolation valves (E12-F008 or E12-F009) to be operable in OCs 4 and 5. If a drainage path from the vessel through the shutdown cooling common suction line was established, no automatic means of isolating the drainage flow path and stopping the loss of reactor coolant would exist per TS requirements. Entergy Operations - GGNS believes it is prudent to provide automatic isolation capability for the common suction line. The proposed TS changes will require the two isolation valves and their associated L3 isolation trip function

trip systems to be operable during OCs 4 and 5. Therefore, an automatic method of isolating the reactor vessel from the shutdown cooling common suction line and mitigating the consequences of a vessel drainage event will be required by the proposed TS changes.

ECCS Requirements (TS 3.5.2)

14. The third condition the NRC identified related to long term ADHRS use was that modifications to TS 3.5.2 should be evaluated by Entergy Operations - GGNS and any necessary changes submitted for approval.

    During the NRC review of one-time TS 3.0.4 exceptions for RF03 it was noted that the TS 3.5.2 LCO lists three ECCS subsystems that can be manually or automatically initiated (LPCI "A", LPCI "B" and LPCI "C") and two systems (LPCS and HPCS) that are automatically initiated when the reactor pressure vessel water level is low. The NRC was concerned that if two manually initiated subsystems were allowed to be operable to meet the LCO, the core may be uncovered by an inadvertent drain event.

    In response to this concern, Entergy Operations - GGNS committed to implement administrative controls in the form of a TSPS to require in part that at least one of the two ECCS required operable by TS 3.5.2 be capable of automatic initiation and injection to the reactor vessel. In addition, the TSPS requires that if no ECCS subsystem/system capable of automatic initiation and injection is operable, then operations which have a potential for draining the reactor vessel will be suspended immediately. The TSPS is in effect for the short term during OCs 4 and 5, including RF03.

15. TS 3.5.2 provides the ECCS operability requirements for OCs 4 and 5. The LCO for TS 3.5.2 contains a provision allowing the LPCI "A", "B" and "C" subsystems of the RHR system to be considered operable with a flow path capable of taking suction from the suppression pool upon being manually realigned. This allows, for example, an RHR subsystem to be aligned and operating as a shutdown cooling loop and, provided a suppression pool suction flow path exists, still be considered an operable LPCI subsystem satisfying the LCO requirements of TS 3.5.2.

16. Entergy Operations - GGNS evaluated the need for automatic LPCI injection capability in OCs 4 and 5. Entergy Operations - GGNS is proposing that TS 3.5.2 be modified to include a requirement in OCs 4 and 5 for one of the two required operable ECCS to be capable of automatic initiation and injection to the reactor vessel. The other ECCS required operable may require manual realignment prior to initiation and injection. Action a of TS 3.5.2 provides requirements that must be met if only one ECCS is operable and ensures that water inventory requirements can be met. The LPCS and HPCS systems and the LPCI subsystems are required to be available to provide reactor vessel inventory makeup following an event which causes inadvertent draining of the reactor vessel when irradiated fuel is in the vessel. TS 3.5.2 Action a will be modified to require that, if the automatic initiation/ injection ECCS is

inoperable and the other operable ECCS requires manual realignment, then operations which have the potential for draining the reactor vessel be suspended. The proposed change shall not be interpreted to preclude completion of actions to place the operation that has the potential to drain the vessel in a safe condition.

17. The proposed changes to TS 3.5.2 will place more restrictive requirements on the ECCS subsystems/systems required operable during OCs 4 and 5 than do the current TS. No longer will manual realignment of both required ECCS subsystems/systems be allowed; one must now be capable of automatic initiation and injection. The proposed change to Action a is also more restrictive than the current Action a. Currently, Action a would allow an additional four hours prior to suspending operations with the potential to drain the reactor vessel. The new Action a will require immediate suspension of these operations if there is no operable ECCS subsystem/system capable of automatic initiation and injection.

18. The proposed TS 3.5.2 changes are intended to reduce the potential consequences of a vessel drainage event. Entergy Operations - GGNS performed an analysis of draindown events in OCs 4 and 5. The objective of the analysis was to demonstrate that the manual realignment provision of TS 3.5.2, as modified, is justified and acceptable in that the operator has sufficient time to recognize the draindown event (i.e., loss of vessel inventory) and to initiate corrective action (i.e., manually realign LPCI). The analysis results support the proposed TS 3.5.2 changes showing that the operator has time to manually realign a LPCI subsystem from the control room without significantly increasing the potential consequences of a reactor vessel drainage event and that the safety function of ECCS is maintained in OCs 4 and 5.

Bases Changes

19. The Bases for TS 3/4.5.2, 3/4.9.11.1 and 3/4.9.11.2 have been revised to reflect the proposed TS changes described above and are attached.

Adverse System Interactions

20. In addition to addressing and proposing resolution to the three conditions identified by the NRC during the Staff's previous review of ADHRS, Entergy Operations - GGNS was to resolve two potential adverse system interactions created by the operation of ADHRS prior to long term ADHRS licensing. The potential adverse interactions involve the operability of the LPCI "A" and LPCI "B" subsystems and the operability of suppression pool water level instrumentation. Resolutions of these potential adverse system interactions are described in Attachment 4 since no TS changes are associated with their resolutions.

Associated Administrative TS Changes

21. Besides the technical changes proposed to the TS described above, administrative changes are also proposed. The administrative

changes consist of deleting information from the TS related to ADHRS and TS 3.0.4 exceptions which were only applicable until startup from RF03 and which no longer apply. The proposed deletions have no safety impact since they are administrative changes.

Previously Approved TS Changes (TS 3/4.3.7.1 and 3/4.8.4.2)

22. Two auxiliary features involved in the implementation of ADHRS required changes to the GGNS TS. These two features were the addition of the PSW radiation monitor and the addition of the motor operator/thermal overload devices to valves E12-F066A and B.

Justification and no significant hazards considerations for the PSW radiation monitor and thermal overload devices were submitted previously in AECM-88/0186 dated September 23, 1988 and approved by the NRC in OL Amendment 59 dated March 27, 1989. These two features are still necessary for the operation of ADHRS; and, since they are already approved by the NRC, no further justification is included with this submittal for their use.

Administrative Controls

23. During the short term licensing of ADHRS, Entergy Operations - GGNS committed to implement various administrative controls for the operation of the ADHRS and RHR in shutdown cooling and water injection modes through the use of plant procedures. Some of the more significant controls were:

a. ADHRS should be stopped and manually isolated if loss of shutdown cooling occurs during OC 4 when the reactor pressure vessel head is on.

b. ADHRS should be isolated on the primary and secondary sides during OC 1, 2 or 3.

c. Simultaneous operation of the ADHRS and RHR loops "A" and "B" for shutdown cooling should be precluded for certain alignments of these systems.

d. Simultaneous operation of ADHRS and LPCI "C" water injection should be precluded.

The same administrative controls committed to in the above letters for short term ADHRS licensing will also be maintained for long term licensing of ADHRS operation, except those superseded by the proposed TS changes.

Summary

24. Based upon the above justification and the proposal of TS changes which address the NRC conditions related to the ADHRS as a supplemental decay heat removal system, Entergy Operations - GGNS believes sufficient TS and administrative controls will exist following NRC approval of the proposed TS amendment to warrant permanent licensing of the ADHRS.

D. NO SIGNIFICANT HAZARDS CONSIDERATIONS

The proposed amendment would revise the TS by adding requirements governing the operation and use of the ADHRS. Requirements related to the operability of decay heat removal system isolation valves during OCs 4 and 5 are added to the TS in order to mitigate the potential consequences of a reactor vessel drainage event. TS changes are also proposed that would restrict the number of ECCS subsystems permitted to be manually realigned prior to initiation and injection during OCs 4 and 5 from two to one and require instead that at least one of the two required operable ECCS subsystems be capable of automatic initiation and injection.

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 - GGNS has evaluated the no significant hazards considerations in its request for a license amendment. In accordance with 10CFR50.91(a), Entergy Operations - GGNS 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. Entergy Operations - GGNS has evaluated UFSAR events which are considered to be applicable during OCs 4 and 5. These events include a dropped fuel bundle and inadvertent criticality. The proposed TS changes do not affect the probability of occurrence of any of these events. The proposed changes would have no effect on fuel handling operations in the containment or in the spent fuel pool because fuel handling procedures and methods remain unchanged. The proposed changes have no effect on control rod interlocks or fuel loading errors and thus do not affect the probability of occurrence of an inadvertent criticality.

   b. Entergy Operations - GGNS has also evaluated the proposed TS changes for impact upon reactor vessel drainage and loss of decay heat removal events. The probability of these events has not been significantly increased by the proposed TS changes. ADHRS when used will be backed up by a decay heat removal system so that if ADHRS were to fail a loss of decay heat removal event would not occur. The proposed changes for the isolation instrumentation and valves will reduce the likelihood of a reactor vessel drainage event since they will now be required operable. ECCS requirements with the proposed changes will not change the probability of either event since ECCS provides mitigation not prevention.

c. The consequences of vessel drainage and loss of decay heat removal events are not significantly increased by the proposed TS changes. The proposed TS changes will place more restrictive controls upon plant operations in OCs 4 and 5 regarding the use of the ADHRS, operable ECCS subsystems/systems, and reactor vessel isolation valves and instrumentation. The proposed TS changes increase the mitigation of these events and reduce their consequences.

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

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

a. The proposed changes do not increase the amount of time ECCS or RHR shutdown cooling loops are unavailable nor do the changes reduce the containment isolation capability. The proposed changes do not increase the potential for draining the reactor vessel. Since the above safety systems are maintained, there is no possibility of a new or different kind of accident from any previously analyzed. The proposed changes are intended to maintain and will, in some cases, increase the level of plant safety.

b. 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 proposed changes will still ensure that core decay heat removal, ECCS makeup capabilities and isolation capability are available when required during OCs 4 and 5. Essential safety systems are operable as necessary during OCs 4 and 5. The proposed TS changes place more restrictions on plant operations during OCs 4 and 5 than do the current TS concerning the use of alternate methods of decay heat removal, ECCS subsystem/system operability, and isolation valve and instrumentation operability.

b. 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.