

March 20, 2001

Mr. William A. Eaton  
Vice President, Operations GGNS  
Entergy Operations, Inc.  
P. O. Box 756  
Port Gibson, MS 39150

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 - COMPLETION OF LICENSING  
ACTIVITY FOR GENERIC LETTER 96-06, "ASSURANCE OF EQUIPMENT  
OPERABILITY AND CONTAINMENT INTEGRITY DURING DESIGN-BASIS  
ACCIDENTS," (TAC NO. M96815)

Dear Mr. Eaton:

The Nuclear Regulatory Commission (NRC) staff issued Generic Letter (GL) 96-06 on September 30, 1996, to all holders of operating licenses for nuclear power reactors, except for those licenses that have been amended to possession-only status. GL 96-06 requested information from licensees related to two concerns: (1) water hammer and two-phase flow in the cooling water systems that serve the containment air coolers, and (2) thermally induced overpressurization of isolated water-filled piping sections in containment. On November 13, 1997, the staff issued Supplement 1 to GL 96-06, informing licensees about ongoing efforts and new developments associated with GL 96-06 and providing additional guidance for completing corrective actions. You responded in letters dated January 28, and November 4 and 20, 1997; September 15, 1998; June 9, August 3 and 12, and November 26, 1999; May 15, 2000; and January 29, 2001. The results of the NRC's review of your responses to GL 96-06 follow.

#### Water Hammer and Two-Phase Flow

You provided an assessment for the water hammer and two-phase flow issues for Grand Gulf Nuclear Station (GGNS), Unit 1, in a letter dated January 28, 1997, and additional information was submitted in letters dated September 15, 1998, August 12, 1999, and May 15, 2000. In addition, this information was clarified during a telephone conversation with the NRC on December 6, 2000.

Based on the information that was provided in the submittals, as clarified during the telephone conversation, it is our understanding that: a) the drywell cooling system is not credited for containment cooling following the event scenarios of interest; b) sufficient static pressure is maintained in the drywell cooling system to prevent steam formation in the fan coolers at temperatures that are less than 200 °F; and c) procedures have been modified to assure that the drywell cooling system will be properly vented and filled prior to restoring the system to service, following isolation, if the drywell temperature exceeded 200 °F at any time during the course of the event scenario.

Based on the above understanding, the NRC staff is satisfied with your response and considers the water hammer and two-phase flow issues of GL 96-06 to be closed.

Thermally Induced Overpressurization

You provided an assessment for the issue of thermally-induced overpressurization of piping runs penetrating the containment for GGNS in a letter dated January 28, 1997, and additional information was submitted in letters dated November 4 and 20, 1997; June 9, August 3, and November 26, 1999; and January 29, 2001.

The NRC staff has reviewed and concurred with your assertion in the January 28, 1997, letter that even if drywell penetration 331 were to fail completely and, in addition, an isolation valve on this penetration were to fail open and result in a leakage path from the drywell to the containment, the drywell bypass leakage rate limit would be a small fraction of the design limit for drywell to containment leakage.

In your January 28, 1997, letter, you identified 18 penetrations (12 in the containment and 6 in the drywell) as potentially vulnerable to a water solid volume that may be subjected to an increase in pressure due to heating of the trapped fluid. Subsequently, in your November 26, 1999, letter, you identified 16 additional penetrations potentially vulnerable to a water solid volume that may be subjected to an increase in pressure due to heating of the trapped fluid. You determined that all of the penetrations are operable based on the criteria in Appendix F of Section III of the American Society of Mechanical Engineers (ASME) Boiler & Pressure Vessel Code (Code). By letters dated November 4, 1997, and November 26, 1999, you committed to take appropriate action to resolve the nonconforming condition for each of the containment and drywell penetrations.

By letters dated June 9 and August 3, 1999, you provided details of your long term corrective actions to resolve the nonconforming condition for each of the containment and drywell penetrations. Based on your further review, by letter dated November 26, 1999, you revised the details of corrective actions to include additional penetrations. You stated that one of the drywell penetrations is used only during plant outages, and committed to revise the GGNS operating procedures during the October 1999 refueling outage to require draining of the line prior to isolation during normal power operation. For nine of the penetrations, you committed to and installed modifications during the October 1999 refueling outage to eliminate thermally-induced overpressurization. In response to the staff's request in a telephone call on June 23, 1999, you provided details of your evaluation methodology for qualifying penetrations by analysis, in a letter dated August 3, 1999. You reanalyzed the piping lines for the faulted load condition and finally determined that two of the penetrations are in compliance with the requirements of ASME Code Case 1606-1, as committed to in the GGNS Updated Final Safety Analysis Report. For two of the containment penetrations, you proposed to adjust the closure time for the inboard and outboard gate valves to allow drainage of the piping due to gravity. You submitted this revision to the licensing basis to the NRC staff and received our approval. You committed to adjust the closure time for the inboard and outboard gate valves for the two penetrations, and implement appropriate corrective action to restore the nonconforming condition to within the ASME Code Case 1606-1 limits for the remaining 20 penetrations prior to restart from the spring 2001 refueling outage.

By letter dated January 29, 2001, you further revised the details of corrective actions and provided a revised schedule. The January 29, 2001, letter indicates that corrective action on 4 of the remaining 21 penetrations will be deferred until refueling outage RFO12, which is scheduled to take place during the fall of 2002. However, since your November 26, 1999, letter

indicated that there were 22 penetrations with modifications deferred until refueling outage RFO11 (spring 2001), the staff asked for clarification during a March 13, 2001, telephone conversation. During that conversation, you indicated that corrective actions to restore penetration 38 to within the ASME Code Case 1606-1 limits were implemented during the October 1999 refueling outage.

Based on the above, the staff concludes that your corrective actions and evaluation provide an acceptable resolution for the issue of thermally-induced overpressurization of piping runs penetrating the containment.

#### Summary

The NRC staff has reviewed your responses to GL 96-06 and finds that all of the requested information has been provided, and that the responses are an acceptable resolution for the issues of water hammer and two-phase flow, and thermally induced overpressurization of piping runs penetrating the containment. Therefore, we consider GL 96-06 to be closed for GGNS.

Please contact me if our understanding of your GL 96-06 responses, as discussed in this letter, is incorrect.

Sincerely,

**/RA/**

S. Patrick Sekerak, Project Manager  
Project Directorate IV & Decommissioning  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-416

cc: See next page

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Please contact me if our understanding of your GL 96-06 responses, as discussed in this letter, is incorrect.

Sincerely,

**/RA/**

Docket No 50-416

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S. Patrick Sekerak, Project Manager  
Project Directorate IV & Decommissioning  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

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\*see previous concurrence

OFFICE	PDIV-1/PM	PDIV-1/LA	PDIV-1/PM	EMEB/SC	SPLB/SC
NAME	TAlexion	DJohnson	PSekerak	KManoly	GHubbard*
DATE	03/13/01	3/19/01	3/16/01	3/15/01	12/11/00

OFFICE	PDIV-1/SC
NAME	RGramm
DATE	3/20/01

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Grand Gulf Nuclear Station

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May 1999