Entergy

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GNRO-2008/00052

July 17, 2008

Director, Spent Fuel Project Office
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Attention: Document Control Desk

Subject: Special Report 2008-001
Violation of Certificate of Compliance 1014 Cask Load Limits for HI-STORM 100 System

Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

Dear Sir or Madam:

This Special Report is submitted in accordance with the HI-STORM Certificate of Compliance (CoC) 1014 Amendment 2, Section 2.2, which requires notification of any spent fuel cask storage system that is loaded in a manner inconsistent with the fuel specifications of Section 2.1.

Specifically, during a data update of the CASKLOADER Database, it was discovered that one HI-STORM 100S-B model multi-purpose canister (MPC) serial number 045 had been loaded with spent fuel bundles that exceeded the CoC Section 2.0 approved content requirements. Verification of the database has determined that 8 fuel assemblies loaded in this MPC exceeded the maximum allowed Decay Heat per Fuel Storage Location Limit or the Fuel Burn-up Limit as specified in CoC Section 2.4 at the time of loading. These conditions are reportable in accordance with CoC Section 2.2 - Violations. Additionally, this MPC as well as three other MPCs contained at least one fuel assembly that required the use of, but were not placed on supplemental cooling as defined in section 3.1.4 of the CoC. The four MPCs involved are HI-STORM 100 MPC serial numbers 045, 069, 214, and 215.

Upon discovery of the condition, the actions contained in Appendix B, Section 2.2 of the CoC, Fuel Specifications and Loading Conditions, were initiated. The affected fuel assemblies were verified to be in a safe condition and the NRC Operations Center was notified of the event within 24 hours. Attachment 1 completes the final action of submitting a Special Report within 30 days.

A commitment is included in this submittal and summarized in Attachment 2.

If you have any questions or require additional information regarding this matter, please contact Dennis Coulter at 601-437-6595.

Sincerely,

Michael J. Larson
Acting Licensing Manger

MJL/DMC/dmc

Attachments: 1. Special Report 2008-001
2. Licensee Identified Commitments Table

cc: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

NRC Senior Resident Inspector
Grand Gulf Nuclear Station
Port Gibson, MS 39150

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Attachment 1

GNRO-2008/00052

Special Report 2008-001

Violation of Certificate of Compliance 1014 Cask Load Limits for HI-STORM 100 System

Special Report 2008-001

Violation of Certificate of Compliance 1014 Cask Load Limits for HI-STORM 100 System

BACKGROUND

Successful fuel bundle selection for dry fuel storage loading requires the proper assignment of fuel parameters to each bundle. These parameters include the initial bundle characteristics (fuel type, length, total weight, uranium weight, uranium enrichment, etc.) and the bundles operating history (burn-up, discharge dates, etc.). The CASKLOADER database is used by Entergy as a repository for this information and to assist in the development of a cask loading plan.

The Corporate BWR/PWR Fuel Engineering group is responsible for assembling the data from various sources, preparing the database (CASKLOADER), and transmitting the database back to the site Reactor Engineering groups. Site Reactor Engineering groups maintain the bundle operating history and transmits this information to the Corporate BWR/PWR Fuel Engineering group as required.

Site Reactor Engineering groups use the processed data to develop strategies for loading individual dry fuel storage casks. Bundle characteristics are verified against the dry fuel storage cask certificate of compliance (CoC) to ensure acceptability for loading as part of the CASKLOADER database. Site Reactor Engineering groups then use the database to maximize efficiency in loading the casks from an exposure (dose) and heat load perspective.

DESCRIPTION OF OCCURRENCE

Entergy discovered on June 18, 2008 at 1412 that due to an error in the CASKLOADER Database, four spent fuel multi-purpose canisters (MPC) were loaded in a manner inconsistent with the CoC for the HI-STORM 100 System. This event is not safety significant since all MPC design limits (e.g., heat load, radiation levels, and criticality) continue to be met although some specific spent fuel assemblies loaded were outside of the conservative individual fuel assembly limits specified in the CoC. Upon discovery of the condition, the actions contained in Appendix B, Section 2.2 of the CoC, Fuel Specifications and Loading Conditions, were initiated by Grand Gulf Nuclear Station (GGNS). The affected fuel assemblies were verified to be in a safe condition and the NRC Operations Center was notified of the event within 24 hours.

Specifically, during a data update of the CASKLOADER Database, it was discovered that one HI-STORM 100S-B model MPC serial number 045 had been loaded with spent fuel bundles that exceeded the CoC Section 2.0 approved content requirements. Verification of the database has determined that 8 fuel assemblies loaded in this MPC exceeded the maximum allowed Decay Heat per Fuel Storage Location Limit or the Fuel Burn-up Limit as specified in CoC Section 2.4 at the time of loading. These conditions are reportable in accordance with CoC Section 2.2 - Violations. Additionally, this MPC as well as three other MPCs contained at least one fuel assembly that required the use of but were not placed on supplemental cooling as defined in section 3.1.4 of the CoC. The four MPCs involved are HI-STORM 100 MPC serial numbers 045, 069, 214, and 215.

CAUSE OF THE VIOLATION

In 2006 work was started on developing the GGNS Dry Fuel Storage program. An engineer in the Corporate BWR/PWR Fuel Engineering group was assigned to develop the CASKLOADER database. The River Bend Station (RBS) database had already been developed and was in use. The assigned engineer used the RBS database development methodology as a model for developing the GGNS database. Modifications to the RBS approach were due to differences in operating history data (format and media). The engineer made these modifications and completed the database development. A second engineer in the Corporate BWR/PWR Fuel Engineering group performed a review of the database. The completed database was then sent to GGNS site reactor engineering.

The first engineer and the second review engineer failed to recognize one important difference between the content of the RBS fuel history data and the GGNS fuel history data. The RBS fuel data was updated annually to capture additional burn-up. The GGNS data was based on the end of each cycle's conditions and were effectively "snapshots" in time. This difference in data content ultimately led to unaccounted burn-up for some of the GGNS fuel that was resident in the core past the cutoff date for the selected data. This ultimately led to a HI-STORM 100S-B model MPC being loaded with fuel bundles that slightly exceeded allowed CoC Decay Heat per Fuel Storage Location Limit and the Fuel Burn-up Limit.

Two root causes were identified. The first root cause was over reliance on a user's knowledge in selection of the scope of data being used for cask loading calculations. No procedure governed this selection process. The second root cause was an inadequate verification process resulting in a program break down by a single human error.

IMMEDIATE CORRECTIVE ACTIONS THAT HAVE BEEN TAKEN

Reviewed fuel assembly burn-up data for the complete GGNS CASKLOADER database. There were 188 fuel assemblies found eligible for MPC loading with incorrect burn-up values. Only a few of these fuel assemblies violated the burn-up limits at the time they were loaded in the affected MPCs. This review did not consider the requirements for the MPCs to be transported off-site. Additional reviews will be required prior to considering these MPCs for transportation.

Reviewed fuel assembly burn-up data for all Entergy CASKLOADER databases. No other potential for errors in burn-up were identified.

Reviewed current decay heat loads for all fuel assemblies loaded in the affected MPCs and determined them to be less than the CoC limits. All MPCs are below the MPC total heat load limit of 28.19 kW and all cooling features for the cask systems are functioning properly. Since the total heat loads in the MPCs are below the required limits, the structural integrity of the MPCs is not challenged. An evaluation of the as loaded configurations was performed on the four MPCs. This evaluation concludes that fuel cladding in the affected MPCs is not adversely affected since the fuel cladding temperature will not exceed the fuel cladding design limit of 400 degrees centigrade.

Verified that fuel assembly exposure assumed in the dose calculations was within the bounds of the exposure of the loaded fuel assemblies. Radiation levels of stored MPCs are within Cask Technical Specification limits and there are no radiation anomalies.

Verified that reactivity parameters are not affected by the identified errors.

All four MPCs are currently considered operable and performing their intended safety functions; all surveillance parameters are within acceptance limits

GGNS Management suspended MPC loading activities. No further load activities will be performed until a procedure for developing the CASKLOADER database is implemented. In the interim, MPCs may be loaded if the load data receives an independent third party review.

LONG TERM CORRECTIVE ACTIONS TO PREVENT RECURRENCE

Condition Report CR-GGN-2008-02844 has been written and will address long term corrective actions to prevent recurrence.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

While loading of fuel assemblies outside CoC limits is not allowed, it is Entergy's position that unloading the affected MPCs to restore compliance is not prudent. Rather, an exemption will be pursued to allow the affected MPCs to remain in storage. Although Entergy is fully capable of doing so, unloading the subject MPCs would subject personnel to unnecessary radiation exposure, generate additional contaminated waste, increase the risk of a possible fuel handling accident, and increase the risk of a possible heavy load handling accident.

Entergy plans to submit the required exemption within 90 days of submitting this special report. Full compliance will be achieved upon the NRC's approval of the submitted exemption.

Attachment 2

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Licensee Identified Commitments Table

Attachment 2 to GNRO-2008/00052

Licensee Identified Commitments Table

This table identifies actions discussed in this letter for which Entergy commits to perform. Any other actions discussed in this submittal are described for the NRC's information and are **not** commitments.

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE (If Required)
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
An exemption will be submitted to allow continued storage of the affected fuel assemblies in their associated multi-purpose canisters.	X		10/14/2008