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GNRO-2012/00031

April 26, 2012

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Supplemental Information – License Conditions
Extended Power Uprate
Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

REFERENCES: 1. Entergy Operations, Inc. letter to the NRC (GNRO-2010/00056),
License Amendment Request - Extended Power Uprate,
September 8, 2010 (ADAMS Accession No. ML102660403)
2. NRC letter to Entergy Operations, Inc. dated March 28, 2012, Grand
Gulf Nuclear Station, Unit 1 – Issuance of Amendment Re: Power
Range Neutron Monitoring System Replacement (TAC NO. ME2531)
(Amendment 188)

Dear Sir or Madam:

Entergy submitted a license amendment request (LAR) for an extended power uprate (EPU) for Grand Gulf Nuclear Station, Unit 1 (GGNS) in Reference 1. The LAR included a proposed License Condition 45 to ensure that the EPU would not be implemented prior to NRC approval of the Power Range Neutron Monitoring System LAR, which had been submitted on November 3, 2009. The NRC has since approved this LAR with the issuance of Amendment 188 to the GGNS Operating License in Reference 2. Entergy requests that this proposed license condition be withdrawn as it is no longer required for the GGNS EPU.

With the withdrawal of the PRNMS license condition, the two of the other three proposed EPU license conditions (spent fuel storage configuration and steam dryer testing) may now be re-numbered. Proposed License Condition 44, dealing with leak rate testing, is not affected by the withdrawal of License Condition 45. A new mark-up of these license conditions reflecting the correct numbering is attached. In addition, the steam dryer license condition has been expanded based on subsequent feedback from the NRC. This is an administrative change.

No change is needed to the no significant hazards consideration included in the initial LAR (Reference 1) as a result of the administrative revision to certain pages of the TS mark-up. There are no new commitments in this letter.

If you have any questions or require additional information, please contact Jerry Burford at 601-368-5755.

I declare under penalty of perjury that the foregoing is true and correct. Executed on April 26, 2012.

Sincerely,



MAK/FGB

Attachments:

1. Revised EPU License Conditions (Mark-up)

cc: Mr. Elmo E. Collins, Jr.
Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
612 East Lamar Blvd., Suite 400
Arlington, TX 76011-4125

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

U. S. Nuclear Regulatory Commission
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State Health Officer
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Attachment 1

GNRO-2012/00031

Grand Gulf Nuclear Station Extended Power Uprate

Revised EPU License Conditions (Mark-up)

Revised EPU License Conditions

This letter provides a revised mark-up of the EPU license conditions to reflect an administrative change: that is, the renumbering of the subsequent proposed license conditions to reflect the withdrawal of the proposed EPU license condition requiring the implementation of the PRNMS. With the approval of the PRNMS LAR, that license condition (proposed as 45) is no longer required. Two subsequent license conditions, one for spent fuel pool configuration and one for steam dryer testing, are to be renumbered 45 and 46. This change does not affect the proposed EPU License Condition 44 regarding leak rate testing. The revised mark-up is provided below. All three conditions have been included here for completeness; they are to be inserted into the GGNS OL immediately following License Condition 43 on page 16a.

- (44) Leak rate tests associated with Surveillance Requirements (SR) 3.6.1.1.1, 3.6.1.3.5, and 3.6.1.3.9, as required by TS 5.5.12 and in accordance with 10 CFR 50, Appendix J, Option B, and SRs 3.6.5.1.1 and 3.6.5.1.2 are not required to be performed until their next scheduled performance dates. The tests will be performed at the EPU calculated peak containment pressure or within EPU drywell bypass leakage limits, as appropriate.
- (45) Through Cycle 19 or until the revised criticality safety analysis has been approved, whichever comes first, the storage cells in the GGNS SFP racks shall be categorized as either Unrestricted or Restricted.
 - (a) Unrestricted cells (Region I) are cells with a minimum panel B10 areal density greater than 0.0179 gm/cm^2 and that have received an exposure less than $2.3\text{E}10$ rads. Unrestricted cells may contain fuel assemblies up to the maximum k-infinity of 1.26 (cold core configuration).
 - (b) Restricted cells (Region II) are cells with either a minimum panel B10 areal density less than 0.0179 gm/cm^2 or that have received an exposure in excess of $2.3\text{E}10$ rads. Storage in Restricted cells shall not credit any Boraflex. Storage shall be controlled in a 10 of 16 configuration (see below). In addition, only fuel assemblies with a k-infinity of less than 1.21 (cold core configuration) may be stored in a Region II cell.

Region II 4X4 Storage Configuration

	B		B
B			
	B		B
		B	



Fuel Assembly Storage Location



Location Physically Blocked to Prevent Storage

- (46) This license condition provides for monitoring, evaluating, and taking prompt action in response to potential adverse flow effects as a result of power uprate operation on plant structures, systems, and components (including verifying the continued structural integrity of the steam dryer) for power ascension from the CLTP (3898 MWt) to the EPU level of 4408 MWt (or 113 percent of CLTP or 115 percent of OLTP).
- (a) The following requirements are placed on operation of the facility before and during the power ascension to 3898 MWt:
1. GGNS shall provide a Power Ascension Test (PAT) Plan for the Steam Dryer testing. This plan shall include:
 - Criteria for comparison and evaluation of projected strain and acceleration with on-dryer instrument data.
 - Acceptance limits developed for each on-dryer strain gauge and accelerometer.
 - Tables of predicted dryer stresses at CLTP, strain amplitudes and PSDs at strain gauge locations, acceleration amplitudes and PSDs at accelerometer locations, and maximum stresses and locations.

The PAT plan shall provide correlations between measured accelerations and strains and the corresponding maximum stresses. The PAT plan shall be submitted to the NRC Project Manager no later than 10 days before start-up.
 2. GGNS shall monitor the main steam line (MSL) strain gages and on-dryer instrumentation at a minimum of three power levels up to 3898 MWt. Based on a comparison of projected and measured strains and accelerations, GGNS will assess whether the dryer acoustic and structural models have adequately captured the response significant to peak stress projections. If

the measured strains and accelerations are not within the CLTP acceptance limits, the new measured data will be used to re-perform the full structural re-analysis for the purposes of generating modified EPU acceptance limits.

3. GGNS shall provide a summary of the data and evaluation of predicted and measured pressures, strains, and accelerations. This data will include the GGNS-specific bias and uncertainty data and transfer function, revised peak stress table and any revised acceptance limits. The predicted pressures shall include those using both PBLE methods (that is, Method 1 using on-dryer data, and Method 2 using MSL data). It shall be provided to the NRC Project Manager upon completion of the evaluation. GGNS shall not increase power above 3898 MWt until the NRC PM notifies GGNS the NRC accepts the evaluation or NRC questions regarding the evaluation have been addressed. If no questions are identified within 240 hours after the NRC receives the evaluation, power ascension may continue.
- (b) The following requirements are placed on operation of the facility during the initial power ascension from 3898 MWt to the approved EPU level (4408 MWt):
1. GGNS shall increase power in increments of approximately 102 MWt, hold the facility at approximately steady state conditions and collect data from available main steam line (MSL) strain gages and available on-dryer instrumentation. This data will be evaluated, including the comparison of measured dryer strains and accelerations to acceptance limits and the comparison of predicted dryer loads based on MSL strain gage data to acceptance limits. It will also be used to trend and project loads at the next test point and to EPU conditions to demonstrate margin for continued power ascension.
 2. Following the data collection and evaluation at the plateaus at approximately 4102 MWt, 4306 MWt, and 4408 MWt, GGNS shall provide a summary of the data and the evaluation performed in Section b.1 above to the NRC Project Manager. GGNS shall not increase power above these power levels for up to 96 hours to allow for NRC review of the information.
 3. Should the measured strains and accelerations on the dryer exceed the level 1 acceptance limits, or alternatively if the dryer instrumentation is not available and the projected load on the dryer from the MSL strain gage data exceeds the Level 1 acceptance limits, GGNS shall return the facility to a power level at which the limits are not exceeded. GGNS shall resolve the discrepancy, evaluate and document the continued structural integrity of the steam dryer, and provide that documentation to the NRC Project Manager prior to further increases in reactor power. GGNS shall not increase power for up to 96 hours to allow for NRC review of the information.
 - a. In the event that acoustic signals (in MSL strain gage signals) are identified that challenge the dryer acceptance limits during power ascension above 3898 MWt, GGNS shall evaluate dryer loads, and stresses, including the effect of ± 10 percent frequency shift, and re-

establish the acceptance limits and determine whether there is margin for continued power ascension.

- b. During power ascension above 3898 MWt, if an engineering evaluation for the steam dryer is required because a Level 1 acceptance limit is exceeded, GGNS shall perform the structural analysis using the Steam Dryer Analysis Report, Appendix A methods to address frequency uncertainties up to $\pm 10\%$ and assure that peak responses that fall within this uncertainty band are addressed.
 4. Following the data collection and evaluation at the EPU power level, GGNS shall provide a final load definition and stress report of the steam dryer, including the results of a complete re-analysis using the GGNS-specific bias and uncertainties and transfer function. The GGNS-specific bias and uncertainties summary shall include both PBLE Method 1 and Method 2. This report shall be transmitted to the NRC within 90 days of achieving the EPU power level. Should the results of this stress analysis indicate the allowable stress in any part of the dryer is exceeded, GGNS shall reduce power to a level at which the allowable stress is met, evaluate the dryer integrity, and assess any shortcomings in the predictive analysis. The results of this evaluation, including a recommended resolution of any identified issues and a demonstration of dryer integrity at EPU conditions, shall be provided to the NRC prior to return to EPU conditions.
- (c) Entergy shall implement the following actions:
1. Entergy shall revise the post-EPU monitoring and inspection program to reflect long-term monitoring of plant parameters potentially indicative of steam dryer failure; to reflect consistency of the facility's steam dryer inspection program with GE SIL 644, "BWR Steam Dryer Failure," Revision 2; and with BWRVIP-139, "Steam Dryer Inspection and Flaw Evaluation Guidelines."
- (d) Entergy shall prepare the EPU PATP to include the following and provide it to the NRC project manager before increasing power above 3898 MWt:
1. Level 1 and Level 2 acceptance limits for on-dryer strain gages, on-dryer accelerometers, and for projected dryer loads from MSL strain gauge data, to be used up to 113 percent of CLTP.
 2. specific hold points and their duration during EPU power ascension
 3. activities to be accomplished during hold points
 4. plant parameters to be monitored
 5. inspections and walkdowns to be conducted for steam, feedwater, and condensate systems and components during the hold points
 6. methods to be used to trend plant parameters

7. acceptance criteria for monitoring and trending plant parameters and conducting the walkdowns and inspections
 8. actions to be taken if acceptance criteria are not satisfied
 9. verification of the completion of commitments and planned actions specified in the Entergy application and all supplements to the application in support of the EPU LAR pertaining to the steam dryer before power increase above 3898 MWt
 10. identify the NRC PM as the NRC point of contact for providing PAT plan information during power ascension
 11. methodology for updating limit curves
- (e) The key attributes of the PAT Plan shall not be made less restrictive without prior NRC approval. Changes to other aspects of the PAT Plan may be made in accordance with the guidance of NEI 99-04, "Guidelines for Managing NRC Commitments," issued July 1999.
- (f) During the first two scheduled refueling outages after reaching full EPU conditions, Entergy shall conduct a visual inspection of all accessible, susceptible locations of the steam dryer in accordance with BWRVIP-139 and GE inspection guidelines. Entergy shall report the results of the visual inspections of the steam dryer to the NRC staff within 60 days following startup.
- (g) At the end of the second refueling outage following the implementation of the EPU, the licensee shall submit a long-term steam dryer inspection plan based on industry operating experience along with the baseline inspection results for NRC review and approval.
- (h) This license condition shall expire upon satisfaction of the requirements in paragraph (f) provided that a visual inspection of the steam dryer does not reveal any new unacceptable flaw or unacceptable flaw growth that is caused by fatigue.