

March 25, 2005

Mr. George A. Williams
Site Vice President
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Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 - REQUEST FOR ADDITIONAL
INFORMATION ON PROPOSED UPGRADED EMERGENCY ACTIONS
LEVELS (EALs) (TAC NO. MC1630)

Dear Mr. Williams:

By letter dated December 16, 2003, you submitted proposed EALs using the methodology outlined in Nuclear Energy Institute 99-01, "Methodology for Development of Emergency Action Levels." In response to the NRC's questions that were provided to your staff on June 23, 2004, you submitted a complete revision to your initial submittal on November 19, 2004. On December 16, 2004, the NRC staff sent you a second round of questions where additional information was needed to complete the review (see Attachment 1).

After the first conference call on February 24, 2005, to discuss the second round of questions, a second follow-up call was scheduled for March 14/15, 2005, to continue to discuss the second round of questions and the time frame for the final formal responses to the second round of requests for additional information (RAIs). However, your staff cancelled the call citing the need for more time to prepare the possible responses to the RAIs. At present, the call has not been rescheduled in the foreseeable future. Les England of the Entergy staff, in the telephone conversation on March 22, 2005, agreed to provide responses to the enclosed questions by April 15, 2005.

Also, as discussed during our conference call on February 24, 2005, please ensure consistency in your responses on generic EAL issues, as applicable. If you have any questions, please contact me at (301) 415-3308.

Sincerely,

/RA/

Bhalchandra Vaidya, Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosure: As stated

cc w/encl: See next page

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GRAND GULF NUCLEAR STATION, UNIT 1 (GGNS)

REQUEST FOR ADDITIONAL INFORMATION (RAI)

ON PROPOSED UPGRADED EMERGENCY ACTIONS LEVELS (EALs)

USING NUCLEAR ENERGY INSTITUTE (NEI) 99-01 (REVISION 4) METHODOLOGY

DATED NOVEMBER 19, 2004

ABNORMAL RADIATION LEVELS / RADIOLOGICAL EFFLUENTS CATEGORY

1. [Initiating Condition (IC) AU1 – EAL 2 / IC AA1 – EAL 2 / IC AS1 – EAL 1 / IC AG1 – EAL 1] Table V to Enclosure 3 lists effluent thresholds for each of the six effluent pathways identified, based on the same meteorological data and Offsite Dose Calculation Manual (ODCM) isotopic mix. In lieu of providing threshold readings for each release point, the licensee has chosen in Table R1 to provide a single threshold reflecting the total curies per second (Ci/sec) readout (Table VI to Enclosure 3), based on a summation of all six identified release points using the alternate EAL option described in Enclosure 3. Clarify the following:
 - a. Footnotes ** and *** in Table VI to Enclosure 3 infer that the isotopic mixture used for ICs AS1 and AG1 is based on Environmental Protection Agency (EPA) study WASH-1400, rather than ODCM isotopic mix used for ICs AU1 / AA1 as reflected in Table V to Enclosure 3 and NEI 99-01 guidance. Resolve this inconsistency. In addition, clarify whether ICs AS1 and AG1 thresholds were determined based on a back calculation using the dose assessment method, versus ODCM calculations, per NEI 99-01 guidance.
 - b. Based on the example provided under the alternate EAL option in Enclosure 3, the threshold of 3.73E-2 Ci/sec appears to be based on the Turbine Building monitor, rather than a summation of all release points as stated. Resolve this apparent inconsistency.
 - c. Description under an alternate EAL option in Enclosure 3 states that the computer point for Channel 5 already exists, but new computer points would need to be developed for Channel 7 and Channel 3. Table R1 provides monitor identification (ID) numbers for ICs AU1, AA1, AS1 and AG1. Provide corresponding monitor identification ID and computer point ID numbers for Tables V and VI in Enclosure 3. In addition, clarify whether these required computer points have been developed and implemented to support total Ci/sec readout as an EAL threshold.
 - d. Clarify whether method(s) exist to promptly determine whether a total Ci/sec threshold has been exceeded based on individual effluent monitor readings, in the event the computer point is lost or out-of-service for an extended period.
2. [IC AU2 – EAL 1.b] Per NEI 99-01 IC AU2, increasing area radiation monitor readings in combination with an uncontrolled water level decrease constitute an Unusual Event.

Licensee IC AU2 indicates that the radiation monitor(s) is in alarm, rather than having increasing readings. Per NEI 99-01 AA2, a valid monitor alarm, by itself, constitutes an alert. In addition, IC AU2 lists "Ctmt 208 Airlock--(P844-1A-A1)", while AA2 lists "Ctmt 209 Airlock--(P844-1A-A1)." Resolve these inconsistencies.

3. [IC AU2 – EAL 2] Licensee's threshold reflects a rise in radiation monitor readings by a factor of 100, or full scale, over alarm setpoints, rather than NEI 99-01 guidance definition of normal levels. Based on licensee wording, the alarm setpoint would reflect "normal" levels, which is not the intent of NEI 99-01 guidance or purpose of alarm setpoint. Resolve this inconsistency.
4. [IC AA2 – EAL 2] Licensee deleted the reference to the site-specific water level due to the lack of installed water level instrumentation on these pools. However, the licensee basis discussion for EAL 2 contains an NEI 99-01 general statement, "...indications may include instrumentation, such as water level..." Resolve this inconsistency.
5. [IC AA3 – EAL 2] Provide technical justification for limiting site-specific areas to any emergency closed cooling system (ECCS) or the reactor core isolation cooling (RCIC) pump rooms. Specifically address why access would not be needed to remote shutdown area(s), electrical distribution panels, emergency diesel generators, etc. to maintain plant safety functions, or other areas containing safety or safe shutdown equipment. In addition, the licensee's response to Specific Comment 3.b established a threshold of > 1E4 rem per hour (R/hr) based on Corporate Radiation Protection (RP) procedures that require specific actions prior to an expected dose of 5 rem (assuming worker could perform activities within 30 minutes). Licensee also identifies that, per procedure RP-105, stay times are required for activities that will result in exposure of > 500 mrem/entry (mR/entry). Provide further justification for why a threshold of 500 mR/hr would not be more applicable per NEI 99-01 guidance that site-specific value(s) should be based on radiation levels which result in exposure control measures intended to maintain doses within normal occupational exposure guidelines and limits, and in doing so will impede necessary access.

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

6. [IC HU5] Clarify whether the setpoint for Strong Motion Accelerometer System Activation (P856-1A-A1) is below operating basis earthquake (OBE) levels.
7. [IC HU6 – EAL 6 / IC HA6 – EAL 5] Table H1 in both ICs HU6 and HA6 provide the same Maximum Safe Operating Values, which would indicate an actual, rather than a potential threat, to safety-related equipment. Clarify whether GGNS provides specific thresholds for Maximum Normal Operating Values, which would be more indicative of the potential impact on safety-related equipment under IC HU6 – EAL 6.
8. [IC HA3] Licensee Basis states that "...monitoring and direction through the Technical Support Center or other emergency response facilities is desirable," rather than "as necessary" per guidance in NEI 99-01 Basis. Resolve this inconsistency.

9. [IC HA4 – EAL 1] EAL statement in Attachment IV (EAL Bases) includes the phrase "...the following areas," which is not contained in EALs (Attachment III). Clarify this inconsistency.
10. [IC HA6 – EAL 1] NEI 99-01 guidance reflects a seismic event greater than OBE. Licensee criteria requires indication of a seismic event beyond the safe shutdown earthquake (SSE) in addition to OBE levels. This is not consistent with NEI 99-01 guidance. Resolve this inconsistency. In addition, clarify whether the remaining criteria (e.g., recorders, flags, indicator lights) will activate upon reaching OBE limits, prior to exceeding an SSE.
11. [IC HA6 – EAL 2] Licensee Basis states "EAL #2 is based on observation of VISIBLE DAMAGE within a VITAL AREA." Per licensee EAL 2 and NEI 99-01 guidance, the EAL is applicable for visible damage to plant structures (containing functions or systems required for safe shutdown) or Control Room indication of degraded performance. As written by licensee, the Basis infers that damage must occur to equipment within a vital area. Resolve this inconsistency.
12. [IC HG1] Licensee added the following statement to the Basis: "Loss of both SSW [safety service water] systems does not by itself constitute loss of decay heat removal capability. Example: In an extended Station Blackout condition using RCIC to maintain RPV [reactor pressure vessel] water level above the Minimum Steam Cooling Water Level, decay heat is removed by steam through an SRV [safety relief valve] to the suppression pool. If containment pressure rises due to suppression pool heat up, the containment can be vented to the environs if necessary to maintain containment pressure within EOP [emergency operating procedures] limits." Venting of containment to the environs based on a loss of the suppression pool is beyond designed system decay heat removal capabilities (ability to maintain a heat sink), since the heat sink is effectively lost. Delete statement regarding venting of containment to atmosphere or provide further technical justification within EOP basis.

EVENTS RELATED TO INDEPENDENT SPENT FUEL STORAGE INSTALLATIONS (ISFSIs)

13. [IC H-EU1 – EALs 1 and 2] Provide specific thresholds for natural phenomena events (e.g., tornado/hurricane, earthquake, flood, extreme environmental temperature) and accident conditions (e.g., explosive over-pressure) consistent with results of ISFSI Safety Analysis Report (SAR) per NUREG-1536 or SAR referenced in the cask's certificate of compliance per NEI 99-01 guidance. In addition, provide missing information designated in licensee Basis (designated with "XXX").

SYSTEM MALFUNCTION (Cold Shutdown Refueling)

14. In proposed EAL matrix (Attachment III), the symbol "D" for DEFUEL, while applicable to a number of ICs, is not listed in the Plant Modes legend at the top of the matrix for the Cold Shutdown / Refueling Category. Resolve this inconsistency.
15. [IC CU1 – EAL 1] Licensee EAL states "Loss of RCS [reactor coolant system] inventory and RPV level < -41.6 inches." Clarify whether RPV level is an indicator of a loss of RCS inventory, or what by what means a loss of RCS inventory is determined.

16. [IC CS2 – EALs 1.b and 2.b] EAL statements in licensee Basis (Attachment IV) are missing the phrase "one or more of the following," which is contained in proposed EAL (Attachment III). As such, per the licensee Basis, both containment high radiation and erratic source range indication are required, rather than either indication per the NEI 99-01 guidance. Resolve this inconsistency.
17. [IC CS2 – EALs 1.b and 2.b / IC CG1 – EAL 2.b] Per the licensee Basis, a threshold was chosen based on results in NEDC-33045P, which indicates that a radiation level of 200 R/hr would be expected in the containment in the event of 1 percent clad failure with full power core source terms and one hour of decay. Conservatively neglecting the direct shine from the reactor core, the licensee concluded that a radiation level of 100 R/hr would be expected before any significant cladding damage had occurred during Modes 4 or 5. Provide monitor readings based on site-specific calculations performed per NEI 99-01 guidance, which conservatively estimates a dose rate indicative of core uncover (i.e., level at top of active fuel).
18. [IC CG1] IC and EALs for CG1 are repeated on pages 4 and 5 in proposed EAL matrix (Attachment III). Resolve this redundant entry.

SYSTEM MALFUNCTION

19. [IC SU9 – EAL 1] Provide the Offgas isolation setpoint based on a post-treatment monitor reading and technical specification (TS) allowable limit.
20. [IC SG1 – EAL 1.b] Licensee identified the criterion, "RPV level cannot be maintained > -192 inches," as the indication of continuing degradation of core cooling, reflecting a fuel clad loss per the fission product barrier matrix. Licensee Basis and NEI 99-01 guidance state that the indication must be based on imminent loss or potential loss of fission product barriers. A potential loss of the fuel clad barrier per licensee EAL FC2 is defined as RPV level < -167 inches. Resolve this inconsistency.
21. [IC SG3 – EAL 1] Per licensee and NEI 99-01 Bases guidance, indication that core cooling is extremely challenged is intended to mean that the reactor vessel water level cannot be restored and maintained above Minimum Steam Cooling RPV Water Level as described in the EOP bases. Provide justification in the licensee Basis for designation of "Entry into SAPs [severe accident procedures]" as meeting this criterion, and whether only specific SAPs (1, 3, 4, 5 or 6) requiring primary containment flooding are applicable. In addition, Basis states that considerations include inability to remove heat via the main condenser or the suppression pool. Clarify whether the criterion that heat capacity temperature limit (HCTL) is exceeded was intended to infer that the main condenser is unavailable.

FISSION PRODUCT BARRIER DEGRADATION

22. [EALs FC3 – PC4] Clarify whether Drywell radiation monitor reading of > 3000 R/hr, as an indicator of fuel clad loss, is based on Table 6-1 to Enclosure 4. Table 6-1 indicates

a reading of 3,537 rem/hr with 5 percent clad failure at time after shutdown (TAS) equal to 0 hours. In addition, provide justification for use of containment radiation monitor reading of > 10,000 rem/hr, as an indicator of primary containment potential loss, since Table 6-1 to Enclosure 4 indicates a reading of 24,673 R/hr with 20 percent clad failure at TAS equal to 0 hours.

23. [EAL RC4] Licensee chose to use an arbitrary value of > 100 R/hr, as a value well in excess of expected drywell radiation readings during normal plant operations. Provide a current drywell radiation monitor reading for normal plant operation with coolant noble gas and iodine inventory within TS allowable limits, which would be indicative of the radiation shine from piping and components in the drywell. In addition, clarify why a site-specific reading, per NEI 99-01 guidance, was not calculated.
24. [EAL PC3] The licensee chose criterion "failure to isolate penetration," in lieu of NEI 99-01 criterion of "Failure of both valves in any one line to close." Identify as a deviation and provide technical justification, or provide change consistent with NEI 99-01 guidance. In addition, the proposed EAL matrix and Basis in Attachments II and IV state "unisolable primary system leak," which is consistent with NEI 99-01 guidance. However, the licensee under differences in Attachment V states that GGNS uses "RCS leakage" instead of primary system leakage. The licensee also uses the undefined acronym "EP" in Attachments III and IV, but EOP under differences in Attachment V. Resolve these inconsistencies.

Grand Gulf Nuclear Station

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