



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION IV  
1600 E. LAMAR BLVD.  
ARLINGTON, TX 76011-4511

January 25, 2017

Mr. Vin Fallacara  
Acting Site Vice President  
Entergy Operations, Inc.  
Grand Gulf Nuclear Station  
P.O. Box 756  
Port Gibson, MS 39150

**SUBJECT: GRAND GULF NUCLEAR STATION - NOTIFICATION OF NRC INSPECTION OF THE IMPLEMENTATION OF MITIGATION STRATEGIES AND SPENT FUEL POOL INSTRUMENTATION ORDERS AND EMERGENCY PREPAREDNESS COMMUNICATION/STAFFING/MULTI-UNIT DOSE ASSESSMENT PLANS (05000416/2017010) AND REQUEST FOR INFORMATION**

Dear Mr. Fallacara:

The purpose of this letter is to notify you that the U.S. Nuclear Regulatory Commission (NRC) staff will conduct a mitigation strategies for beyond-design-basis external events, spent fuel pool instrumentation, and emergency preparedness enhancements inspection at the Grand Gulf Nuclear Station from March 6 – 10, 2017. The inspection will consist of three reactor inspectors from the NRC's Region IV office, plus one of the assigned Resident Inspectors at Grand Gulf for one week. The inspection will be conducted in accordance with the NRC's Temporary Instruction 2515/191, "Inspection of the Implementation of Mitigating Strategies and Spent Fuel Pool Instrumentation Orders, and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans."

Experience has shown that this inspection is resource intensive both for the NRC inspectors and licensee staff. In order to minimize the impact to your onsite resources and to ensure a productive inspection, we have enclosed a request for documents needed for this inspection activity. Please note that the documents are requested to be provided by February 17, 2017. During the onsite inspection, inspectors will verify that plans for complying with NRC Orders EA-12-049 and EA-12-051 are in place and are being implemented. Inspectors will also verify the establishment of staffing and communications plans provided in response to the March 12, 2012, request for information letter, and multi-unit dose assessment information provided per COMSECY-13-0010, Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned, dated March 27, 2013. These plans and information were provided in the site specific submittals, which were subsequently reviewed by the NRC staff for understanding and documented in the NRC's plant safety evaluations (SEs) and safety assessments. Therefore, appropriate personnel knowledgeable of the station's FLEX strategies, spent fuel pool instrumentation, and emergency preparedness enhancements should be available to support the inspectors at the site during the inspection.

We have discussed the schedule for this inspection activity with your staff and understand that our regulatory contact for this inspection will be Sheryl Sweet of your licensing organization. If there are any questions about this inspection or the material requested, please contact the lead inspector, Ryan D. Alexander, by telephone at (817) 200-1195 or by e-mail at [ryan.alexander@nrc.gov](mailto:ryan.alexander@nrc.gov).

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150 0011. The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid Office of Management and Budget control number.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Greg Warnick, Chief  
Project Branch C  
Division of Reactor Projects

Docket No: 50-416  
License No: NPF-29

Attachment:  
FLEX Strategies, Spent Fuel Pool  
Instrumentation, & EP Enhancements  
Inspection Request for Information

GRAND GULF NUCLEAR STATION - NOTIFICATION OF NRC INSPECTION OF THE IMPLEMENTATION OF MITIGATION STRATEGIES AND SPENT FUEL POOL INSTRUMENTATION ORDERS AND EMERGENCY PREPAREDNESS COMMUNICATION/ STAFFING/MULTI-UNIT DOSE ASSESSMENT PLANS (05000416/2017010) AND REQUEST FOR INFORMATION – JANUARY 25, 2017

DISTRIBUTION:

Regional Administrator (Kriss.Kennedy@nrc.gov)  
 Deputy Regional Administrator (Scott.Morris@nrc.gov)  
 DRP Director (Troy.Pruett@nrc.gov)  
 DRP Deputy Director (Ryan.Lantz@nrc.gov)  
 DRS Director (Anton.Vegel@nrc.gov)  
 DRS Deputy Director (Jeff.Clark@nrc.gov)  
 Senior Resident Inspector (Matt.Young@nrc.gov)  
 Resident Inspector (Neil.Day@nrc.gov)  
 Site Administrative Assistant (Amy.Elam@nrc.gov)  
 Branch Chief, DRP/C (Greg.Warnick@nrc.gov)  
 Senior Project Engineer, DRP/C (Cale.Young@nrc.gov)  
 Project Engineer, DRP/C (Michael.Stafford@nrc.gov)  
 Public Affairs Officer (Victor.Dricks@nrc.gov)  
 Project Manager (Siva.Lingam@nrc.gov)  
 Team Leader, DRS/IPAT (Thomas.Hipschman@nrc.gov)  
 Project Engineer, DRS/IPAT (Eduardo.Uribe@nrc.gov)  
 RITS Coordinator (Marisa.Herrera@nrc.gov)  
 ACES (R4Enforcement.Resource@nrc.gov)  
 Regional Counsel (Karla.Fuller@nrc.gov)  
 Senior Congressional Affairs Officer (Jenny.Weil@nrc.gov)  
 RIV Congressional Affairs Officer (Angel.Moreno@nrc.gov)  
 RIV/ETA: OEDO (Jeremy.Bowen@nrc.gov)  
 RIV RSLO (Bill.Maier@nrc.gov)  
 Inspection Team Lead, Sr. Project Engineer, DRP/A (Ryan.Alexander@nrc.gov)

Electronic Distribution for the Grand Gulf Nuclear Station

ML17026A429

ADAMS ACCESSION NUMBER:

<input checked="" type="checkbox"/> SUNSI Review By: RDA	ADAMS: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sensitive <input checked="" type="checkbox"/> Non-Sensitive	<input type="checkbox"/> Non-Publicly Available <input checked="" type="checkbox"/> Publicly Available	Keyword NRC-002
OFFICE	DRP/RPBA	C:DRP/RPBC		
NAME	RAlexander	GWarnick		
SIGNATURE	/RA/ by E	/RA/		
DATE	01/24/2017	01/25/17		

OFFICIAL RECORD COPY

**Request for Information**  
**FLEX Strategies, Spent Fuel Pool Instrumentation, & EP Enhancements Inspection**  
**Grand Gulf Nuclear Station**

Inspection Report: 05000416/2017-010

Inspection Dates: March 6 – 10, 2017

Inspection Procedure: Temporary Instruction 2515/191, "Inspection of the Implementation of Mitigating Strategies and Spent Fuel Pool Instrumentation Orders, and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans"

Inspectors: Ryan D. Alexander, Team Lead, Sr. Project Engineer, Region IV  
Two Additional Inspectors – TBD, Region IV  
Neil Day, Resident Inspector, Grand Gulf

**Information Requested for the In-Office Preparation Week**

The following information should be sent to the Region IV office in hard copy or electronic format (use of the Certrec IMS information portal is preferred), to the attention of Ryan Alexander, by February 17, 2017. The inspectors will select specific items from the information requested below and then request from your staff additional documents needed during the onsite inspection week. Also, we request that you categorize the documents in your response with the numbered list below. Please provide requested documentation electronically if possible. If requested documents are large and only hard copy formats are available, please inform the lead inspector, and provide subject documentation during the first day of the onsite inspection. If you have any questions regarding this information request, please call the lead inspector as soon as possible.

TI 2515/191 - Appendix A

1. Provide current revision of the FLEX Final Integrated Plan (i.e., current FLEX Program Document), including any revisions since the May 2016 submission to the NRC
2. Provide the FLEX Strategy Basis Document
3. Provide each operating, off-normal, abnormal, and/or emergency procedures where entry into the FLEX Support Guideline(s) are initiated
4. Provide a list of key pieces of equipment that directly perform a FLEX mitigation strategy for core cooling, containment, and/or spent fuel pool cooling.
5. Provide a list and copies of every FLEX Support Guideline (FSG) or equivalent procedure which you developed or revised to implement your mitigating strategies. Provide copies of the FSGs/procedures which address (as applicable):
  - a. Restoration of AC power to essential loads (with or without alternate AC power source(s))
  - b. DC Load shedding
  - c. Primary (RCS) loss and makeup, including water source(s)
  - d. Containment isolation and safe shutdown valve operations while AC power is unavailable

- e. Monitoring and makeup options to the Spent Fuel Pool
  - f. Portable lighting (e.g., flashlights or headlamps) necessary for ingress and egress to plant areas required for deployment of FLEX strategies
  - g. Communications systems necessary for ingress and egress to plant areas required for deployment of FLEX strategies
  - h. Achieving area access during a loss of AC power, including the Protected Area and internal locked areas where remote equipment operation is necessary
  - i. Mitigating the effects of a loss of forced ventilation/cooling
  - j. Access and pathways to locations where operators will be required to perform local manual operations
  - k. Equipment failure does not occur as a result of loss of heat tracing during extended loss of all AC power (ELAP)
  - l. Replenishment of fuel to diesel/gas powered equipment (e.g., FLEX diesel generators, pumps, etc.)
  - m. Implementation of portable systems (such as portable power supplies & portable pumps)
  - n. Deployment routes and locations for FLEX portable equipment
  - o. Deployment of portable power supplies for providing backup power to the containment hydrogen igniters (BWR Mark III specific)
  - p. Actions to maintain the FLEX equipment necessary to support shutdown risk processes/procedures (i.e., FLEX strategies in Shutdown and Refueling Modes)
  - q. How FLEX equipment could be deployed or pre-deployed/pre-staged to support maintaining or restoring key safety functions in the event of a loss of shutdown cooling
6. Applicable site specific hazards for GGNS
- a. Seismic
    - i. Provide documents which show the locations and configuration of structures which store FLEX equipment.
    - ii. Provide the evaluation/evidence to support that FLEX equipment is stored in location(s) such that each location:
      - 1. Meets the plant's design basis Safe Shutdown Earthquake, OR
      - 2. Meets the design requirements as described in ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures," OR
      - 3. Is outside a structure and evaluated for seismic interactions to ensure equipment is not damaged by non-seismically robust components or structures.
    - iii. Provide documentation that explains how large portable FLEX equipment such as pumps and power supplies are secured to protect them during a seismic event (i.e., Safe Shutdown Earthquake (SSE) level).
    - iv. Provide documents which show that stored equipment and structures are protected from seismic interactions to ensure that unsecured and/or non-seismic components do not damage the equipment.
    - v. Provide the travel route(s) for FLEX equipment from storage location(s) to their location(s) of use, AND evaluation(s) which demonstrate that for the potential for soil liquefaction is not of a concern for these travel route(s).
    - vi. Seismic concerns for water source(s)

1. If the FLEX water sources are seismically robust, then provide the assessment which demonstrates.
  2. If the FLEX water sources are not seismically robust, then provide:
    - a. an assessment of alternate water sources, and
    - b. the procedure(s) which describe when and how to access those sources.
  - vii. If power is required to move or deploy FLEX equipment, then describe and identify the locations of the power supplies which provide that power, and provide the procedures which describe implementing those power supplies.
  - viii. If equipment is needed to move the FLEX equipment, provide documents that show how that equipment is protected from the seismic event.
  - ix. Provide documents which show that the FLEX equipment connection points to permanently installed plant system are seismically qualified to the same extent as the permanently installed equipment.
  - x. Provide documents which show that staged tools used to connect FLEX equipment are acceptable/compatible with the connections used.
- b. External Flooding
- i. Provide description of where FLEX equipment is stored relative to protection from flood waters in accordance with site flood analysis.
    1. If any FLEX equipment is stored below flood level, then (1) on an event timeline, show when that equipment will be needed; and (2) provide the procedure(s) used to retrieve and deploy that equipment.
  - ii. Provide your plans to support successful FLEX equipment deployment for floods which persist over a long time period.
  - iii. Provide how you will supply fuel oil to FLEX equipment during flood conditions (if different from response to Item 5.I).
  - iv. If credited in the strategy, provide plans/procedures for use of water extraction pumps capable of operating during an ELAP are available, including available power sources.
  - v. If credited in the strategy, provide plans/procedures for storage and deployment of temporary flood barriers, including timeline of deployment strategy.
- c. Severe storms with high winds
- i. Provide evaluation/evidence as to how FLEX equipment is stored relative to protection from severe storms with high winds:
    1. In a structure that meets the plant's design basis for high wind hazards (e.g., existing safety-related structure); OR
    2. In a structure that meets the design requirements as described in ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures," given the limiting tornado wind speeds from Regulatory Guide 1.76, and/or design-basis hurricane wind speeds.
  - ii. Provide pathways via which you plan to move FLEX equipment from onsite storage areas to final deployment locations.
    1. Show how you designated and evaluated those pathways for post-storm accessibility for staging and connecting FLEX equipment.

d. Ice, Snow, and Extreme Cold

- i. Provide evaluation/evidence as to how FLEX equipment is stored relative to protection from ice, snow, and extreme cold:
  1. In a structure that meets the plant's design basis for the snow, ice and cold conditions (e.g., existing safety-related structure); OR
  2. In a structure that meets the design requirements as described in ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures," for the snow, ice, and cold conditions from the site's design basis.
- ii. For each key piece of equipment described in Item 4 (above) that directly performs or implements a FLEX mitigation strategy:
  1. Provide document(s) demonstrating that the FLEX equipment is maintained at a temperature within a range to ensure that it will function when called upon.
  2. Provide document(s) demonstrating that the FLEX equipment was procured to function in the extreme snowfall and ice storm conditions applicable to the site.
  3. Provide document(s) demonstrating how the FLEX equipment can be moved from the storage location to its deployment location during extreme snowfall and ice storms.
- iii. At the site, if the Ultimate Heat Sink (UHS) and flow path may be affected by extreme low temperatures due to ice blockage or formation of frazil ice, provide documentation to show that you have evaluated the loss of UHS and its impact on room/equipment cooling for the deployment of the FLEX equipment.

e. Extreme high temperatures

For each key piece of equipment described in Item 4 (above) that directly performs or implements a FLEX mitigation strategy:

- i. Provide the document which describes the high-temperature limit of the range within which the equipment will function.
  - ii. Describe how the equipment is maintained below that limit in its storage location.
7. Provide the station-specific FLEX strategies time validation study(ies)
8. Relative to the testing and maintenance program for FLEX equipment, for each key piece of equipment described in Item 5 (above) that directly performs or implements a FLEX mitigation strategy:
- a. Identify the equipment and provide documents that describe either how you tested the equipment (including electrical cables) or how you used other means to verify that the equipment can perform its required function.
  - b. If the equipment is portable, then provide documents that describe how maintain and test the equipment in accordance with INPO AP-913 or an acceptable alternative.
9. Provide documents which describe the programmatic controls in place to ensure that if equipment and applicable connections are unavailable (e.g., due to maintenance), then compensatory measures are implemented in accordance with guidance outlined NEI 12-06.
10. Identify the procedure(s) provided in response to Item 5 (above) which address:
- i. early notification to mobilize the offsite response,
  - ii. establishment of a point of delivery for the off-site equipment,
  - iii. arrangements for delivery and deployment at the site, and

- iv. sufficient supplies of commodities to support the equipment and site personnel
  - a. Provide documents which describe your evaluation of what equipment and commodities are needed to sustain and backup the site's coping strategies.
  - b. Provide documents which show that you have established means to ensure that fuel for FLEX equipment can be delivered to the site if onsite fuel is unusable or depleted.
  - c. Provide documents which describe the process by which you will revise the required supplied equipment due to changes in the FLEX strategies or plant equipment or equipment obsolescence.
11. Provide documents which show that your installed standard mechanical and electrical connections are compatible with Phase 3 equipment.
- a. Provide the station-specific National SAFER Center "Playbook"
12. Relative to personnel training on FLEX strategies, provide:
- a. FLEX training bases document(s)
  - b. Lesson plans for site emergency response leaders responsible for the implementation of FLEX strategies. (Records for staff completing this training may be requested to be provided to the inspectors during the onsite inspection week.)
  - c. Lesson plans for site personnel responsible for the execution of mitigating strategies for BDBEEs (i.e., operators, craft personnel, security, radiation protection, etc.) to ensure familiarity and considering available job aids, instructions, and mitigating strategy time constraints.
13. Provide the procedure(s) which describe your configuration control program, and
- a. Provide lists that identify by number, name, and revision number the documents, drawings, sketches, calculations, analyses, procedures/guidance and evaluations related to your FLEX mitigation strategies.
14. Listing of corrective action program document summaries generated related to FLEX equipment, strategies, procedures, and/or training.

TI 2515/191 - Appendix B

15. Provide the procedures you approved for maintenance, testing, calibration, and use of the primary and backup Spent Fuel Pool (SFP) instrumentation channels.
16. Provide documents which describe the training program that addresses the use, maintenance, calibration, surveillance, and the use of alternate power to the primary and backup SFP instrument channels. Specifically provide training materials used in that program.

TI 2515/191 - Appendix C

17. Communications:
- a. Provide documents which show that the communications system(s), technologies, equipment and power supplies would be available from the beginning of the event and operate during an ELAP.
  - b. Provide documents which show that you have completed appropriate maintenance and testing program activities to verify off-site response organizations communication systems operate as designed.



- c. Provide the procedures and/or guidance used to implement the communication capabilities.
- d. Provide documents which show that you have added any new communications equipment, portable power supplies and/or systems have been added to ongoing testing and preventative maintenance programs.

18. Staffing:

- a. Provide documents which show that onsite and augmented staff will be available to implement the strategies in response to a large scale natural event that results an ELAP and impedes access to the site, and that functions/tasks have been appropriately staffed.
- b. Provide documents which show that the site access methods (e.g., roadways, navigable bodies of water and dockage, airlift, etc.) expected to be available following the event and available to the Emergency Response Organization (ERO) [as described in your Phase 1 and 2 staffing assessments and NRC safety assessment].
- c. Provide documents which show the testing, training, and drills/exercises performed by you to demonstrate the ERO's ability to utilize the communications systems and/or equipment.

19. Provide document/procedures which show that your dose assessment program/tools are capable of analyzing concurrent radiological releases from all significant on-site sources, including releases from spent fuel pools during an ELAP (i.e., multi-source dose assessment).

Lead Inspector Contact Information:

Ryan D. Alexander, Sr. Project Engineer  
817-200-1195  
[Ryan.Alexander@nrc.gov](mailto:Ryan.Alexander@nrc.gov)

Mailing Address:  
U.S. NRC, Region IV  
1600 East Lamar Blvd.  
Arlington, TX 76011-4511  
Attn: Ryan Alexander, DRP