

## PMSTPCOL PEmails

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**From:** Foster, Rocky  
**Sent:** Wednesday, January 30, 2013 11:46 AM  
**To:** Scheide, Richard; wemookhoek@stpegs.com; Elton, Loree  
**Cc:** STPCOL  
**Subject:** Fukushima 4.2 draft RAI 7013  
**Attachments:** draft RAI 7013.doc

Dick,

Attached is the draft RAI for the Fukushima Recommendation 4.2 for our discussion next week.

The conference call-in information for the telecom for Wednesday, February 6, 2013 from 1:00pm – 3:00pm is as follows:

Toll Free Number: (888) 791-4689  
Passcode: 53296

The proposed agenda for the telecom is as follows:

Fukushima Recommendation 4.2  
EP Enhancement Rule  
Fukushima recommendation 9.3

Thanks,

Rocky

**Hearing Identifier:** SouthTexas34Public\_EX  
**Email Number:** 3546

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**Subject:** Fukushima 4.2 draft RAI 7013  
**Sent Date:** 1/30/2013 11:46:12 AM  
**Received Date:** 1/30/2013 11:47:14 AM  
**From:** Foster, Rocky

**Created By:** Rocky.Foster@nrc.gov

**Recipients:**

"STPCOL" <STP.COL@nrc.gov>  
Tracking Status: None  
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| draft RAI 7013.doc | 43630       |                        |

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## Request for Additional Information

Issue Date:

Application Title: South Texas Project Units 3 and 4 - Dockets 52-012 and 52-013

Operating Company: South Texas Project Nuclear Operating Co

Docket No. 52-012 and 52-013

Review Section: 01.05 - Other Regulatory Considerations

Application Section: 01.05

### QUESTIONS

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#### **RAIs for STP Unit 3 and 4 on Mitigating Strategies**

The applicant responded to a RAI related to Fukushima Near Term Task Force (NTTF) Recommendation 4.2, "Mitigation," in FSAR Section 1E.2.4. The staff reviewed FSAR Section 1E.2.4 based on the information in NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," and guidance documents in the Interim Staff Guidance (ISG) for the Compliance with Order EA-12-049," and NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide."

In a conference call, dated January 16, 2013, the staff indicated to the applicant on its finding that FSAR Section 1E.2.4 does not have sufficient details about how the applicant would perform the mitigation functions specified in the Order on maintaining or restoring core cooling, containment and spent fuel pool (SFP) cooling under the stated conditions. In general, the staff found that the FSAR Section 1E.2.4 has not adequately documented capabilities, nor provided strategies for the specified mitigation functions. The questions below are representative examples designed to clarify staff expectations for information to be contained in the application (FSAR or in supporting documents) to enable the staff to draw conclusions about how the STP Units 3 and 4 could conform with the terms of the order (if imposed).

Examples of specific information that would be needed is described below. A revised application addressing the points rather than item-by-item response to specific questions would be an acceptable response to this RAI (see for example RAI-10 below).

#### **STP RAI 1E.2.4-01 Applicable Beyond -Design-Basis External Events**

Identify and characterize all the applicable site specific beyond-design-basis external events (e.g., earthquake, high winds, and external flooding ...etc.) that are subject to the mitigation strategies. Identification involves determining whether the type of hazard applies to the site. Characterization focuses on the likely nature of the challenge (e.g., station blackout and loss of normal access to the ultimate heat sinks) in terms of timing, severity, and persistence. NEI 12-06, Section 4.1, "Site-Specific Identification of Applicable Hazards," provides an acceptable guidance.

#### **STP RAI 1E.2.4-02 Initial Phase**

NRC issued an Order requiring a three-phase approach for mitigating beyond-design-basis external events. These mitigation strategies must be capable of mitigating a simultaneous loss of all ac power and loss of normal access to the ultimate heat sink and have adequate capacity to address challenges to core cooling, containment, and spent fuel pool (SFP) cooling capabilities at all units on a site. FSAR Section 1E.2.4 identified several new equipments such as power supplies and pumps for the mitigation strategies. The staff found that the identified new equipments can not perform the mitigation functions specified in the Order to maintain or restore core cooling, containment and spent fuel pool (SFP) cooling. The applicant is requested to identify all the necessary (existing and new) equipments to demonstrate adequate capability to perform the mitigation functions for each of the three phases. The initial phase requires the use of installed equipment and resources to maintain or restore core cooling, containment and SFP cooling capabilities. Explain how the STP Units 3 and 4 establish adequate capabilities for the specified functions assuming a simultaneous loss of all ac power and loss of normal access to the normal heat sink.

- a) Identify all the installed equipments and resources that are used for (1) core cooling, (2) containment function, and (3) SFP cooling during the initial phase.
- b) The equipments for the initial phase, designed for the design basis events (DBE), which are designed for core cooling, containment function, and SFP cooling, when power supplies and ultimate heat sinks are available. Identify all the supplemental equipments required to address the issues of station blackout and loss of normal access to the ultimate heat sinks for the duration of the initial phase. Address the availability of these equipments following the external events (e.g., the earthquake, flooding, and high wind condition) including the seismic capability of the power supplies and water sources.
- c) Discuss the connections between the supplemental equipments and the installed DBE equipments to address the issues of station blackout and loss of normal access to the ultimate heat sinks and how to connect and integrate the supplemental equipments with the installed DBE equipments to perform the specified functions for core cooling, containment function, and SFP cooling respectively.
- d) Determine the duration of the initial phase. Explain the bases for the determination.

**STP RAI 1E.2.4-03 Transition Phase**

In the transition phase, the heat loads are significantly reduced from the initial phase, but the issues of station blackout and loss of normal access to the ultimate heat sinks remain. The transition phase requires sufficient, portable, onsite equipment and consumables to maintain or restore these functions (core cooling, containment, and SFP cooling) until they can be accomplished with resources brought from off site.

- a) Determine the required coping capability (e.g., heat loads from core cooling, SFP, containment) in the transition phase
- b) (1) Identify all the portable, onsite equipment and resources for the transition phase, and (2) demonstrate the adequacy of the capability for each of the three specified functions (e.g., flow rate requirements for core cooling, SFP cooling, and containment function) assuming station blackout and loss of normal access to the ultimate heat sinks remain.
- c) Describe how to transfer from the initial phase installed equipment to transition phase equipment.
- d) Discussion on the connections between the supplemental equipments and the installed equipments and how to integrate the supplemental equipments with the installed equipment to perform the required functions for core cooling, containment heat removal, and SFP cooling respectively.
- e) Discuss the instrument and control of the mitigation equipments.
- f) Following beyond-design-basis events, equipment being relied upon to support the transition phase could be damaged. How would the applicant provide reasonable protection for the associated equipment from external events?  
How are the required equipment protected from the beyond-design-basis events? Discuss the functional capability of piping, valves, pumps, heat exchangers, power supplies, instrument and controls, and water sources following beyond-design-basis external events.
- g) Determine the duration of the transition phase; explain the bases for the determination.

**STP RAI 1E.2.4-04 Final Phase**

In the final phase, the heat loads are further reduced from the transition phase. The final phase requires obtaining sufficient offsite resources to sustain critical safety functions indefinitely. NEI 12-06 Section 10 provides guidance. The applicant is requested to define site-specific FLEX capability and identify the equipment and demonstrate adequate capability for the final phase. Address the following issues.

- a) Determine the required coping capability (i.e. heat load, flow rates for (1) core cooling, (2) containment function, and (3) SFP cooling) in the final phase.
- b) Identify all the required offsite equipment and resources for the final phase.
- c) Explain how the offsite equipment will integrate with the onsite equipment to perform the required functions described in the Order.
- d) How soon the offsite resources are required?
- e) Demonstrate the coping capability (e.g., power supply, water sources) can be sustained indefinitely.

**STP RAI 1E.2.4-05 Clarify the Role of ACIWA in the Mitigating Strategies**

FSAR Section 1E.2.4 states that “Operation of the ACIWA system is discussed in DCD Subsection 5.4.7.1.1.10.” It implicitly indicates the Alternating Current-Independent Water Addition (ACIWA) system being used for mitigating strategies.

1. Clarify in the FSAR which phase of the three-phase mitigating strategies the ACIWA mode is accounted for in addressing NTF Recommendation 4.2.
2. Explain how the ACIWA mode can address Recommendation 4.2 by demonstrate the capability of the system to maintain or restore core cooling, containment integrity, and spent fuel cooling following beyond-design-basis external events. Address the following specifics.
  - a) How much water sources are available? For how long can the water last for the mitigation strategies? Does it require water makeup and how is the makeup water available?
  - b) What is the flow rate of the ACIWA? Demonstrate the adequacy of the flow rate to remove the heat loads.
  - c) What is the designed heat load of the system? Demonstrate the system has sufficient capacity to remove the heat.

**STP RAI 1E.2.4-06 Procedures and Training**

The applicant states that the detailed procedures and training developed during implementation of operational programs as described in FSAR Section 13.4S will be developed in cooperation with Units 1 and 2 as a 4-unit site and will address all of the NRC requirements. Specifically, the staff identifies the following inadequacies.

- a) The staff found that FSAR Section 13.4S, “Operational Program Implementation,” and FSAR Table 13.4S-1, “Operational Programs Required by NRC Regulation and Program Implementation,” do not include any discussion for beyond-design-basis events. Describe the content of the procedures and training, and provide the completion schedule, and proper commitment or license condition in the FSAR.
- b) The applicant ambiguously indicated that ACIWA is used to address “Mitigating Strategies for Beyond Design Basis Events,” and the staff found that the procedures for using ACIWA are in DCD Section 19.9.7, and FSAR Section 19.9.7, “Procedures and Training for Use of AC-Independent Water Addition Mode.” However, FSAR Section 1E.2.4 does not recognize DCD Section 19.9.7 for training and procedures. Instead, the FSAR refers the training and procedures to FSAR Section 13.4S, which does not have anything for beyond-design-basis events. By ignoring DCD Section 19.9.7 and FSAR Section 19.9.7 in FSAR Section 1E.2.4, it appears that the applicant does not recognize the role of ACIWA in addressing NTF Recommendation 4.2. This is ambiguous.

Clarify in the FSAR whether DCD Section 19.9.7 and FSAR Section 19.9.7 are applicable for NTF Recommendation 4.2 to satisfy portions of the requirement for training and procedures. If not, why not? If yes, what will be needed for training and procedures beyond DCD Section 19.9.7 and FSAR Section

19.9.7? Clarify the confusion why the irrelevant section is referenced, but the relevant sections are ignored.

**STP RAI 1E.2.4-07 FLEX Program**

It is stated in FSAR 1E.2.4 that STP 3&4 will implement applicable portions of the FLEX program. Clarify what portions of the FLEX program (NEI 12-06) are applicable, and what portions are not applicable and why not. For the applicable portions, demonstrate how to implement.

**STP RAI 1E.2.4-08 Guidance and Strategies**

NRC Order EA 12-049 requires all applicants to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment and SFP cooling capabilities following beyond- design-basis external event. In response, the applicant states in FSAR Section 1.E.2.4 that “STP 3 & 4 will develop, implement, and maintain guidance and strategies to restore core cooling, containment, and SFP cooling following a beyond design basis external event involving one or both STP 3 & 4 units.” The above statement without substance of the guidance does not satisfy the intent of the Order. NEI 12-06 Appendix F provides an example of the guidance for AP1000 design. The applicant is requested to provide a site-specific guidance and strategies for STP, Units 3 and 4 to respond the Order.

**STP RAI 1E.2.4-09 Multi-Unit Concern**

The mitigating strategies were developed in the context of a localized event that was envisioned to challenge portions of a single unit. The event at Fukushima, demonstrate that beyond-design-basis external events may adversely affect multi-units. Address the multi-unit concern in FSAR Appendix 1E Section 2.4 in accordance with NTTF Recommendation 4.2 and NRC Order EA-12-049, “Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events.”

**STP RAI 1E.2.4-10 FSAR Revision**

Revise FSAR to provide a comprehensive discussion to respond to the Order by addressing all the key issues identified in the above RAIs.