

## **NRR-PMDAPEm Resource**

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**From:** Regner, Lisa  
**Sent:** Thursday, June 29, 2017 1:24 PM  
**To:** Paul.Duke@pseg.com  
**Cc:** Ennis, Rick; Regner, Lisa  
**Subject:** Salem and Hope Creek - Request for Additional Information Concerning Emergency Action Level Scheme Change (MF9268/69/70)  
**Attachments:** Salem and Hope Creek RAI final to licensee.docx

Request for Additional Information (RAI)  
Regarding License Amendment Request (LAR)  
for Emergency Action Levels (EAL) Scheme Change (CAC Nos. MF9268/69/70)  
*[attached]*

On June 23, 2017, the NRC staff sent PSEG a draft RAI. This RAI related to a LAR submitted on February 13, 2017, in which PSEG requested approval of an EAL scheme change for Hope Creek Generating Station (HCGS) and Salem Generating Station (SGS) (Agencywide Documents Access and Management System (ADAMS) Accession No ML17044A346).

On June 28, 2017, the NRC and PSEG staff held a clarification call to discuss the draft RAI and ensure PSEG understood the questions. During that call, PSEG identified information that was in the submittal that the staff had missed; thus, several questions were deleted. On June 29, PSEG subsequently informed the NRC staff that the information requested was understood and no additional clarifications were necessary.

Mr. Paul Duke agreed to provide a response to the **final RAI (attached)**, **within 45 days** from the dated of this email correspondence. The NRC also informed the licensee that a publicly available version of this final RAI would be placed in ADAMS.

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REQUESTS FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST

EMERGENCY ACTION LEVEL SCHEME CHANGE

HOPE CREEK GENERATING STATION

SALEM GENERATING STATION

DOCKET NOS. 50-354, 50-272, AND 50-311 (CAC NOS. MF9268, MF9269, AND MF9270)

By letter dated February 13, 2017, PSEG Nuclear, LLC (PSEG) requested approval for an emergency action level (EAL) scheme change for Hope Creek Generating Station (HCGS) and Salem Generating Station (SGS) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17044A346).

The requirements of Section 50.47(b)(4) to Title 10 of the *Code of Federal Regulations* (10 CFR) state, in part, that:

*A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee...*

The most recent industry EAL scheme development guidance is provided in the Nuclear Energy Institute (NEI) document NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors" (ADAMS Accession Number ML12326A805). By letter dated March 28, 2013, the NRC endorsed NEI 99-01, Revision 6, as acceptable generic (i.e., non-plant-specific) EAL scheme development guidance.

HCGS and SGS propose to revise their current EAL scheme to one based upon NEI 99-01, Revision 6 (hereafter referred to as "endorsed guidance").

The requests for additional information (RAI) listed below are necessary to facilitate the continued technical review being conducted by the Office of Nuclear Security and Incident Response/ Division of Preparedness and Response, Reactor Licensing Branch (NSIR/DPR/RLB). A timely and thorough response to these draft RAIs is requested in order to meet the proposed deadline requested by the licensee.

**RAI-1 HCGS and SGS**

NEI 99-01, Revision 6, Section 4.7, "EAL/Threshold References to AOP [Abnormal Operating Procedure] and EOP [Emergency Operating Procedure] Setpoints/Criteria," states: "As reflected in the generic guidance, the criteria/values used in several EALs and fission product barrier thresholds may be drawn from a plant's AOPs and EOPs," and "Developers should verify that appropriate administrative controls are in place to ensure that a subsequent change to an AOP or EOP is screened to determine if an evaluation pursuant to 10 CFR 50.54(q) is required."

Please explain what controls are in place at HCGS and SGS to ensure that a subsequent change to an AOP or EOP is screened to determine if an evaluation pursuant to 10 CFR 50.54(q) is required.

**RAI-2 HCGS and SGS**

Section 8.3 of EP-HC/SA-325-201 states, “The ECG is not a stand-alone document. At times, the ECG will refer the user to other attachments or procedures for accomplishment of specific evolutions such as: Accountability, Recovery, development of PARs, etc.” and that, “The ECG classification sections allow for judgement and decision making as to whether or not an EAL is exceeded.” These statements could potential delay or prevent an emergency classification.

Describe how Section 8.3 of EP-HC/SA-325-201 will be modified to clearly indicate when an emergency classification should be made (i.e., when an EAL threshold value is met).

**RAI-3 HCGS and SGS**

HCGS/SGS proposed EAL Section 8.5, Emergency Short Duration Events in EP-HC/SA-325-201, states in part:

Short Duration events that occur will be assessed and emergency classification made, if appropriate, within 15 minutes of control room indications or the receipt of the information, indicating that an EAL has or had been exceeded. This classification is to be made even if no EALs are currently being exceeded (i.e., actions have been taken to stabilize the Plant such that no EALs currently apply).

Section 8.5 of EP-HC/SA-201 appears to combine discussion elements for “short-lived events” and “transient conditions” in a manner that can cause confusion. Sections 2.5 and 2.6 of proposed EP-HC-325-202 provide guidance for short lived events and transient conditions that appear to provide greater clarity and are more closely aligned with endorsed guidance.

Describe how the proposed Section 8.5 of EP-HC/SA-325-201 will be revised to more closely align with proposed Sections 2.5 and 2.6 of EP-HC-325-202 to provide consistency within the basis document and to align with endorsed guidance.

**RAI-4 HCGS and SGS**

EP-HC/SA-325-201, which is an introduction section to the technical basis document, includes Section 8.5 which appears to be more of a procedure or usage guide than an introduction. Section 8, “Event Classification Guide (ECG) Use,” appears to be redundant to EP-HC/SA-325-202, “ECG Usage.” This redundancy could result in a misclassification of short-lived events or conditions.

Explain this redundancy in Section 8, “Event Classification Guide (ECG) Use,” from EP-HC/SA-325-201 and/or describe how it will be rectified.

**RAI-5 HCGS**

For RU1.1, the last bulleted statement in the proposed Explanation/Discussion/Definitions for RU1.1 concludes with “The Turbine Building Circulating Water.” There appears to be missing information. Please rectify.

**RAI-6 SGS**

For RA1.1, the proposed Explanation/Discussion/Definitions discussion provides that an “Alert” release value is 1.0% of the Site Area Emergency value. An “Alert” release value is 10% of the Site Area Emergency value. Please rectify.

**RAI-7 SGS**

For RA1.2, the proposed SGS Explanation/Discussion/Definitions discussion provides that the minimum exclusion area (MEA) is .79 miles.

The closest location just beyond the OWNER CONTROLLED AREA where a member of the general public could gain access. For Salem the MEA, is .79 miles.

For RS1.2 and RG1.2, the definition of minimum exclusion area uses a value of .56 miles.

Please verify that which distance is correct and revise accordingly.

**RAI-8 HCGS**

NEI 99-01, Revision 6, AA2 basis includes “This IC applies to irradiated fuel that is licensed for dry storage up to the point that the loaded storage cask is sealed. Once sealed, damage to a loaded cask causing loss of the CONFINEMENT BOUNDARY is classified in accordance with IC E-HU1.”

The HCGS proposed EALs RA2.1 and RA2.2 does not appear to include the above information. Please rectify or explain why this information is not applicable.

**RAI-9 SGS**

For RA2.1, the basis provides “...loss of the CONFINEMENT BOUNDARY is classified in accordance with EAL **RU1.4**.”

There is no RU1.4 in the proposed scheme. Please correct the discrepancy.

**RAI-10 HCGS**

NEI 99-01, Revision 6, Section 4.3, “Instrumentation Used for EALs” states, in part:

Scheme developers should ensure that specified values used as EAL setpoints are within the calibrated range of the referenced instrumentation, and consider any automatic instrumentation functions that may impact accurate EAL assessment. In addition, EAL setpoint values should not use terms such as “off-scale low” or “off-scale high” since that type of reading may not be readily differentiated from an instrument failure.

HCGS proposed EALs RS2.1 and RG2.1 bases states that the setpoint for these EALs corresponds to off scale low indication for this instrument.

Please explain how this indication could not be confused with a failed instrument or provide a setpoint within the indicating range of the instrument.

#### **RAI-11 HCGS and SGS**

Concerning RU4.1, the Explanation/Discussion/Definitions for RU4.1 provide that the licensee intends to continue to use the provided radiation levels as threshold values based on their current certificate of compliance as a “conservative” value for future certificates of compliance. The inclusion of this statement could constitute staff approval for any and all future certificates of compliance regardless of the impact on the accuracy of assessments for this EAL.

Please clarify the Explanation/Discussion/Definitions statement to ensure that an implied approval allowing continued use of the existing threshold values for potential future certificate of compliance changes is not implied.

#### **RAI-12 HCGS and SGS**

The HCGS and SGS EAL Basis discussions for HA1.1 and HS1.1 include the following statement:

The first threshold is applicable for any HOSTILE ACTION occurring, or that has occurred, in the OWNER CONTROLLED AREA. This includes any action directed against an ISFSI that is located outside the plant PROTECTED AREA.

However, the information provided in the HCGS and SGS difference matrices provides the following statement:

HCGS has an ISFSI located inside the plant Protected Area.  
SGS has an ISFSI located inside the plant Protected Area.

Please resolve these apparent inconsistencies.

#### **RAI-13 HCGS and SGS**

The HCGS and SGS EAL Basis discussions for HS1.1 include the following statement:

PROJECTILES that are directed into or that have impacted the PA from the OCA or beyond are considered under this EAL as HOSTILE ACTIONS within the PA.

The above statement, as provided, states that any projectile impact that occurs within the protected area would be classified as Site Area Emergency.

Please consider removing the statement from the Basis discussions for EAL HS1.1 as it is not in accordance with the endorsed guidance.

#### **RAI-14 HCGS**

HCGS proposed EAL HU2.1 threshold value includes, “Amber alarm light on the Seismic Switch Power Supply Drawer Panel 10C673.” The Explanation/Discussion/Definitions section indicates the amber event alarm light will extinguish when ground acceleration reduces below 0.01 g. It further states, “The amber Seismic Switch Event Alarm on the Seismic Switch Power Supply (SP-1) will illuminate at an acceleration equal to or exceeding 0.1 g (OBE).”

Please clarify whether or not the amber light in the threshold value is the same amber light discussed in the Explanation/Discussion/Definitions section. If they are the same light, please explain how the amber light can be used as a threshold value for HU2.1.

#### RAI-15 **HCGS**

HCGS proposed EAL HU3.3 Explanation/Discussion/Definitions includes, “as used here the term ‘offsite’ is meant to be areas external to the Protected Area.” That statement infers that a different definition is normally used for the term “offsite”.

Please consider including that statement in the EAL and on the wallboard to prevent possible misclassification, or provide a justification for why that is not necessary.

#### RAI-16 **HCGS**

Proposed HCGS EAL HU4.1 does not include the Turbine Building, as in the current HU2.1.

Please provide an explanation for omitting the Turbine Building from this EAL from the proposed HU2.1.

#### RAI-17 **HCGS and SGS**

For HCGS and SGS, the proposed EAL HS6.1 Explanation/Discussion/Definitions section includes a statement that defines the clock start time. This start time is not included in the threshold value. Additionally, these statements are not consistent with each other.

Please add the start time criteria directly to the threshold value or include it as a note, or explain how inaccurate assessments of HS6.1 will be prevented without this information immediately available to the decision maker.

#### RAI-18 **HCGS**

Proposed HCGS EAL SS2.1 Explanation/Discussion/Definitions includes a table of battery capacities and also states that the EAL is the hot equivalent of EAL CU5.1

- a. Please explain the purpose of the battery capacity table, including how the decision maker would use it for classification purposes.
- b. EAL CU5.1 appears to be associated with communication systems, not DC electrical busses. Please correct this apparent discrepancy.

#### RAI-19 **HCGS and SGS**

For HCGS and SGS EAL SA3.1, lists (3<sup>rd</sup> bullet) in Table S-2, “Significant Transients,” “Electrical load rejection > 22% [HCGS] and 25% [SGS] electrical load.” This is inconsistent with the endorsed guidance that states: “Electrical load rejection > 25% **full** electrical load” *[emphasis added]*.

Please correct to be consistent with endorsed guidance, or explain how this difference may not result in inconsistent classifications for conditions where the plant is not at full power at the time of the initiating event.

## RAI-20 HCGS

The proposed HCGS EAL SU4.1 utilizes a high alarm for the off-gas pretreatment radiation monitor. The alarm setpoint is greater than an order of magnitude less than the technical specification limit. The initiating condition for HCGS EAL SU4.1 is "Reactor coolant activity greater than Technical Specification allowable limits." Additionally, the proposed HCGS Explanation/Discussion/Definitions states, "UNUSUAL EVENT declaration is warranted only when actual fuel damage has occurred."

Please explain how the proposed threshold value will not result in unnecessary declarations or revise the threshold value for SU4.1 to align with endorsed guidance.

## RAI-21 HCGS

For the proposed HCGS EALs SU6.1, SA6.1 and SS6.1 a power level (greater than or equal to 4%) was added to the EALs. The intent of the endorsed guidance is to align the EAL classifications with site-specific EOP criteria for a successful reactor shutdown, which would benefit the decision makers by providing consistent criteria. The power level provided in the developer notes in the endorsed guidance is an example that represents one typical EOP indication for a generic power plant and was not intended to be a complete list of EOP indications for any specific power plant. In addition to reactor power levels, BWRs typically determine whether the "Rx is shutdown under all conditions without boron" as indication of a successful reactor trip. The proposed anticipated transient without a scram (ATWS) EALs for HCGS appear to rely solely on a reactor power of 4% as indication of a reactor trip.

Please clarify the HCGS EALs SU6.1, SA6.1 and SS6.1 to reflect the EOP reactor shutdown criteria in the EOPs, or show how wording similar to endorsed guidance will be used to support timely and accurate assessment of HCGS EALs SU6.1, SA6.1 and SS6.1.

## RAI-22 SGS

For the proposed SGS EALs SU6.1, SA6.1 and SS6.1 a power level (greater than or equal to 5%) was added to the EALs. The intent of the endorsed guidance is to align the EAL classifications with site-specific EOP criteria for a successful reactor shutdown, which would benefit the decision makers by providing consistent criteria. The power level provided in the developer notes in the endorsed guidance is an example that represents one typical EOP indication for a generic power plant and was not intended to be a complete list of EOP indications for any specific power plant. The Reactor Trip or Safety Injection Action/Expected Response for Typical Westinghouse plants include reactor power decreasing and rod insertion indications to determine if the ATWS response procedure should be initiated. Additionally, the subcriticality critical safety function status trees for typical Westinghouse plants include both power and startup rate to determine if an ATWS has occurred. The proposed ATWS EALs for SGS appear to rely solely on a reactor power of 5% as an indication of a reactor trip.

Please clarify SGS EALs SU6.1, SA6.1 and SS6.1 to reflect the EOP reactor shutdown criteria in the EOPs, or describe how the wording similar to the endorsed guidance will be used to support timely and accurate assessment of SGS EALs SU6.1, SA6.1 and SS6.1.



## RAI-23 HCGS and SGS

Concerning HCGS EALs CA6.1 and SA8.1; and the SGS EALs CA6.1 and SA9.1, based on recent discussions between the NRC, NEI and industry, the proposed NRC staff response to EPFAQ 2016-002 has substantially changed. The latest guidance is listed on the EPFAQ page in the "EPFAQs under Review" section (ADAMS Accession No. ML17096A388). The clarifications provided by EPFAQ 2016-002 should be considered to ensure consistent EAL classifications that are aligned with the intent of an Alert classification.

Considering the recent changes to the EPFAQ 2016-002 guidance, discuss changes to be made, if any, to HCGS EALs CA6.1 and SA8.1; and SGS EALs CA6.1 and SA9.1 to ensure consistent EAL classifications that are aligned with the intent of an Alert classification.

## RAI-24 HCGS and SGS

The proposed HCGS/SGS EAL Technical Bases Explanation/Discussion/Definitions sections for the loss and potential loss of the Fuel, RCS, and Containment barriers includes the following:

The Emergency Director Judgment threshold addresses any other factors relevant to determining if the Fuel Clad barrier is potentially lost. Such a determination should include IMMEDIATE barrier degradation, barrier monitoring capability and dominant accident sequences.

- Imminent barrier degradation exists if the degradation will likely occur within two hours based on a projection of current safety system performance.
- Barrier monitoring capability is decreased if there is a loss or lack of reliable indicators. This assessment should include instrumentation operability concerns, readings from portable instrumentation and consideration of offsite monitoring results.
- Dominant accident sequences lead to degradation of all fission product barriers and likely entry to the EOPs. The Emergency Director should be mindful of the Loss of AC power (Station Blackout) and ATWT/S EALs to assure timely emergency classification declarations.

The proposed HCGS/SGS basis wording appears to bound and/or modify the fission product barrier thresholds which rely on the opinion of the Emergency Director for an indication of loss or potential loss of fission product barriers. Please clarify the proposed HCGS/SGS EAL Technical Bases Explanation/Discussion/Definitions section for the loss and potential loss of the Fuel, RCS, and Containment barriers as necessary to remove any wording that could either bound and/or modify the judgement of the Emergency Director concerning a loss, or potential loss, of a fission product barrier, or explain how this wording will not potentially inhibit the Emergency Director's judgement.

## RAI-25 HCGS

The proposed EALs HCGS CS1.2 and CG1.2 Explanation/Discussion/Definitions section states, "This EAL applies to conditions in which the loss of decay heat removal capability has caused a significant drop in RPV level and core uncover may be challenged." Considering that the initiating condition for HCGS CS1.2 and CG1.2 are based on the effects of a loss of inventory, the provided statement does not appear to be correct. Additionally, the provided statement seems to apply that the concern is a **challenge to core uncover** vice **core uncover** being the concern.

Please revise the proposed EALs HCGS CS1.2 and CG1.2 Explanation/Discussion/Definitions statement describing these EALs as a loss of cooling condition to reflect the EALs initiating condition which is related to a loss of RPV inventory.

**RAI-26 HCGS**

Proposed HCGS EAL CA3.1 threshold value includes a reference to "Note 1." However, no note 1 is included in the threshold value for CA3.1. Please rectify this apparent discrepancy.

**RAI-27 HCGS and SGS**

The definitions contained in NEI 99-01, Revision 6, for a General Emergency, Site Area Emergency, Alert and Notification of Unusual Event classification levels begin with "Events are in progress..." The HCGS and SGS definitions in Attachment 3 of Alert, General Emergency, Site Area Emergency and Unusual Event begins with "Events are in process [*Emphasis added*].

Additionally, Section 2.4, "General Emergency," begins with "Events are in process..."

Please revise these definitions to reflect the definitions in the endorsed guidance or provide a justification for the difference.