

NRR-PMDAPEm Resource

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Subject: Palo Verde Nuclear Generating Station, Units 1, 2, and 3 - Official RAIs for EAL LAR (CAC Nos. MF6803, MF6804, and MF6805)
Attachments: Palo Verde EAL Official RAIs.docx

Attached please find the **official** requests for additional information (RAIs) needed to support U.S. Nuclear Regulatory Commission staff's continued technical review of the proposed emergency action level (EAL) scheme change license amendment request (LAR) submitted to us on October 9, 2015 (Agencywide Documents Access and Management System Accession No. ML15293A335) by Arizona Public Service Company. Please provide your responses within 60 days from the date of this e-mail.

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REQUESTS FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST

EMERGENCY ACTION LEVEL SCHEME CHANGE

PALO VERDE NUCLEAR GENERATING STATION

DOCKET NOS. 50-528, 50-529 AND 50-530

By letter dated October 9, 2015, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15293A335), Arizona Public Service Company (APS) is requesting approval of a proposed change in the emergency action level (EAL) scheme used at the Palo Verde Nuclear Generating Station, Units 1, 2, and 3 (PVNGS), as described in Attachment 3, EAL Technical Basis Document, to this letter. APS proposes to revise its current PVNGS EAL scheme to one based upon Revision 6 to Nuclear Energy Institute (NEI) document NEI 99-01 [Revision 6], "Development of Emergency Action Levels for Non-Passive Reactors" (ADAMS Accession No. ML12326A805).

The **official** requests for additional information (RAIs) listed below are needed to support U.S. Nuclear Regulatory Commission (NRC) staff's continued technical review of the proposed EAL scheme change. We transmitted the draft RAIs to you on March 11, 2016, and we had a clarification call on March 22, 2016. As mutually agreed, please provide your responses within 60 days from the date of this e-mail. Your timely responses will allow the NRC staff to complete its review on schedule.

RAI-PV-1

Section 2.5, "Technical Bases Information," describes the bases as "a plant-specific basis section that provides PVNGS-relevant information concerning the EAL. This is followed by a Generic basis section that provides a description of the rationale for the EAL as provided in NEI 99-01 Rev. 6." EAL decision-makers may be confused between these two sections when the information appears to be inconsistent. Please explain the reasoning for two sections rather than one basis section that is specific to the plant and includes the applicable generic information, or revise accordingly.

RAI-PV-2

NEI EAL AU1(2) is not included in the proposed EAL scheme. Please provide justification for not including this in the proposed EAL scheme, or revise the EAL accordingly per endorsed guidance.

RAI-PV-3

Section 4.3, "Instrumentation Used for EALs," to NEI 99-01, Revision 6, states (in part): "*Scheme developers should ensure that specific values used as EAL setpoints are within the calibrated range of the referenced instrumentation.*" Please confirm that all setpoints and indications used in the proposed EAL scheme are within the calibrated range(s) of the stated

instrumentation and that the resolution of the instrumentation is appropriate for the setpoint/indication.

For example: Plant Vent RU-143 CH-1 >1.22E-02 uCi/cc
Fuel Building RU-146 CH-1 >1.13E-01 uCi/cc

RAI-PV-4

Section 5.0, "Definitions, Acronyms, & Abbreviations," does not contain a definition for OWNER CONTROLLED AREA, even though it is used in the current PVNGS Emergency Plan and EALs. Please provide justification for its removal, or revise accordingly to include.

RAI-PV-5

NEI basis statement, "*classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past the monitor is known to have stopped...*" is included in the bases for EALs RA1.2, RA1.3, RS1.2, and RG1.2. Since these EALs are independent of radiation monitors, the statement is not applicable and may be confusing, resulting in a delay in classification. Please remove that statement from the bases, or explain how it is applicable.

RAI-PV-6

EAL RU2.1 includes level indication (visual or Refueling Water Level Indicating System (RWLIS)). The PVNGS Basis references a remote spent fuel pool (SFP) level indication, PCN-LSHL-3. Please explain why PCN-LSHL-3 is not included in this EAL, or revise accordingly. If PCN-LSHL-3 can only be read in the vicinity of the SFP, please clarify the basis description stating, "*The SFP level is remotely monitored by...*" as this could be interpreted as remote from the SFP or remote from the Control Room.

RAI-PV-7

For EAL RU2.1, please explain why the word "Unplanned" was removed from the alarm thresholds as it appears in endorsed guidance, or revise accordingly.

RAI-PV-8

EAL RA2.2 is based on receiving a high alarm on listed radiation monitors. Please verify that the listed radiation monitors would be expected to alarm high for damage to irradiated fuel or provide an expected range indication for any radiation monitors not expected to reach the high alarm setpoint.

RAI-PV-9

For EALs RS2.1 and RG2.1, please explain the statement, "*...(includes a 1 ft. 10 inches instrument indication margin),*" as it relates to this EAL threshold.

RAI-PV-10

For EAL RA3.1, please add “by survey” to “Central Alarm Station (CAS)” to ensure that this is clearly acceptable for this particular location and appears on the EAL wallboard, or provide justification for not including.

RAI-PV-11

For EALs RA3.2 and HA5.1, please add a note to the basis section to remind users that this EAL is intended to be applicable to ALL Operating Modes but that limiting the Operating Modes to those determined to be necessary for the scope of this EAL is acceptable. However, if plant and/or system design is changed, such that other areas for other Operating Modes become applicable, then it is expected that these areas be added to the table for the applicable Operating Mode(s).

RAI-PV-12

For EAL CU1.1, please incorporate the information in the PVNGS Basis related to the limitations with the RWLIS [Refueling Water Level Indicating System] as a note to the EAL to ensure it is captured on the EAL wallboards, or provide justification for not including.

RAI-PV-13

For EALs CU1.2, CA1.2, CS1.1, CG1.1, RCS [Reactor Coolant System]-Loss 1, RCS-Potential Loss 1 and Containment-Loss 1, please explain the statement, “*A RCS Leak is considered unisolable if the leak cannot be isolated within 15-minutes,*” as this did not come from the endorsed guidance, or revise accordingly.

RAI-PV-14

For EAL CU4.1, please explain why “vital” was removed from the EAL as in endorsed guidance, or revise accordingly.

RAI-PV-15

For EAL CA1.1, please explain why the proposed value of 101 ft., 6 in. is different than the current EAL threshold of 101 ft. 4 in. (no basis for this level in current EAL), or revise accordingly.

RAI-PV-16

For EAL CA3.1, please confirm that the engineering unit specified for capturing the reactor coolant system pressure increase is correct. Current EAL has units in “psi [pounds per square inch],” while the proposed EAL has “psia [pounds per square inch absolute].”

RAI-PV-17

For EAL CA2.1, the PVNGS basis states (in part): “*the condition indicated by this EAL is the degradation of the offsite and onsite power sources such that any additional single failure would result in a loss of all AC [alternating current] power to the emergency buses.*” This conflicts with the included NEI 99-01 basis, which states (in part): “*this IC addresses a total loss of AC power*”

that compromises the performance of all SAFETY SYSTEMS requiring electric power including those necessary for emergency core cooling, containment heat removal/pressure control, spent fuel heat removal and the ultimate heat sink.” Please revise the basis to eliminate this discrepancy, or provide further justification for this inconsistency.

RAI-PV-18

For EALs CA2.1, SS1.1 and SG1.2, per the Developer Notes in endorsed guidance, the licensee may establish the capability to power an essential bus from an alternate power supply during the additional time that may be potentially available. Please remove the table from these EALs as the intent is to capture events of concern when the busses have no power, regardless of the source, or provide further basis for retaining. In addition, please remove any information in the basis section that limits consideration of any other sources.

RAI-PV-19

CA6.1 and SA9.1 PVNGS basis (first three bulleted items) provides details of seismic events, flooding and high winds. These descriptions could cause a delay in declaration or a failure to declare an Alert due to attempting to determine if the cause of the failure meets the description in the basis (e.g., high wind less than or in excess of 105 mph). Please delete these descriptions or provide a justification for including this information.

RAI-PV-20

For EALs CS1.1 and CG1.1, please explain why the other EALs from the endorsed guidance cannot be implemented at PVNGS, as they are in the current EALs. Please explain why the staff should consider removing these EALs from the PVNGS scheme, or revise accordingly. Also, explain why RVLMS [Reactor Vessel Level Monitoring system] levels are not used.

RAI-PV-21

PVNGS EALs CS1.1 and CG1.1 include the definition of “unisolable” and the Basis statement, *“a RCS leak should be considered unisolable if the leak cannot be isolated within 15 minutes.”* These EALs do not refer to unisolable RCS leaks. Please remove the references to unisolable leakage or provide an explanation of why it is desired.

RAI-PV-22

For EALs CG1.1 and Containment-Potential Loss 2 (for the hydrogen concentration), please explain why the values for the noted radiation monitor and for the containment hydrogen concentration are different than what is currently in place. The radiation monitor value is currently 10,000 mR [milli-Roentgen]/hr with 9,000 mR/hr proposed. The containment hydrogen concentration is currently 4.5% with 4% proposed.

RAI-PV-23

For EALs HU1.1, HA1.1, HS1.1 and HG1.1, please explain how the term “security team” can be synonymous with “security supervision,” as the intent of the EAL is to ensure an individual specifically trained on communicating with the Control Room, through hostile action-based drills, is tasked with this responsibility, or revise accordingly.

RAI-PV-24

For EAL HU2.1, please explain: (1) how timely the process is for using the “Modified-Mercalli Intensity Scale,” and (2) what the relationship is between that and the 0.1g OBE [operating basis earthquake] value for PVNGS; or revise accordingly. Consider use of the alternate wording provided in Developer Notes, with a preplanned confirmation.

RAI-PV-25

For EAL HA1.1, please explain why the staff should consider a change from the current “owner controlled area” to the proposed “secured owner controlled area.” Please elaborate on the distinction between the two terms, as well as the basis for why consideration should be given to restrict the area of concern for these EALs, or revise accordingly. In addition, by adding this term to the NEI 99-01 Basis section of these EALs, it is implied that this term is used in NEI 99-01, which it is not.

RAI-PV-26

Proposed EAL HS6.1 allows 45 minutes to gain control of key safety functions. The existing EAL HS2 allows 15 minutes to gain control of key safety functions. The proposed basis states (in part), “*Auxiliary Feedwater can be initiated as late as 45 minutes after reactor trip, per the PVNGS Fire Protection Analysis.*” Please provide evidence supporting establishment of reactivity and RCS inventory control as late as 45 minutes, instead of the expected 15 minutes, or revise the EAL accordingly.

RAI-PV-27

EAL SU1.1 is based on a loss of offsite AC power. The basis referenced in Table S-1 includes onsite AC power sources. Consider modifications to the table in the basis, and the wording of the EAL and the EAL wallboard, to prevent possible confusion.

RAI-PV-28

For EALs SU3.1 and SA3.1, please add a note Table S-2 for the Auxiliary feed flow to capture that downcomer flow instruments can be credited for this indication, or provide basis for not including.

RAI-PV-29

For EAL SU5.1, please consider deleting references to RCS Loss and Potential Loss thresholds as they are not applicable to this EAL or explain how they are applicable.

RAI-PV-30

For Fission Product Barrier (FPB) Fuel Clad Category A -- Potential Loss 1: RVLMS < 21% plenum, Pant Specific basis indicates this level corresponds to 4 inches above the fuel alignment pin. PVNGS Updated Final Safety Analysis Report Appendix 18B states that the RVLMS measures reactor vessel water levels above the fuel alignment plate. Please revise the basis accordingly.

RAI-PV-31

FPB Fuel Clad Category B -- Loss 1 and Potential Loss 1 contain the undefined term "Rep CETs [representative core exit thermocouples]." Please provide a definition for Rep CET.

RAI-PV-32

FPB Reactor Coolant System -- Potential Loss 1 is not consistent with endorsed guidance, which states the threshold is based on maintaining pressurizer level within limits by operation of a normally used charging pump (emphasis added). Additionally, the NEI 99-01 Change Summary includes the following: "*The RCS P-Loss leak rate threshold has been simplified - instead of quantifying the leak rate (i.e., determining if the leak rate is greater than a pump capacity), the new threshold requires classification if operation of a standby charging (make-up) pump is required. This action would be directed by an AOP [abnormal operating procedure]/EOP [emergency operating procedure] in response to indications that unisolable RCS leakage, or SG [steam generator] tube leakage, is beyond the capacity of one charging pump (e.g., letdown is isolated and pressurizer level continues to decrease).*" Please revise this threshold and basis, or provide additional justification for the proposed change as written.

RAI-PV-33

FPB Fuel Clad Category B -- Potential Loss 2, and FPB Reactor Coolant System Category B -- Potential Loss 1, "RCS heat removal cannot be established", are not consistent with NEI 99-01, Revision 6. The guidance states, (in part), "*enter the site-specific parameters and values that define an extreme challenge to the ability to remove heat from the RCS via the steam generators.*" Please provide the parameters and values in the EALs which indicate that RCS heat removal cannot be established, or explain how decision makers could consistently reach the conclusion that heat removal cannot be established.

RAI-PV-34

Concerning FPB Containment Category B -- Potential Loss 1, the additional condition representing an imminent core melt sequence is included in the current PVNGS EAL scheme:

- a. Rep CET greater than 700 'F.
AND
- b. RVLMS less than 21% plenum.
AND
- c. Restoration not effective within 15 minutes.

Please explain why this is not applicable to the proposed FPB Containment Category B -- Potential Loss 1, or revise accordingly.

RAI-PV-35

Concerning Plant Specific Basis for FPB Containment Category D items below:

- a. References to RCS Loss are unnecessary and could be confusing. Potential Loss encompasses the conditions in each of the bulleted statements;
- b. Where leak rates are greater than or equal to the Potential Loss threshold, a fifteen minute time limit for leak isolation is not consistent with endorsed guidance, and

c. The fourth bulleted sentence is incomplete.

Please modify the basis to address the bullet items above, or provide additional justifications for the basis as written.