NRR-DMPSPEm Resource

From: Chawla, Mahesh
Sent: Friday, June 15, 2018 10:08 AM
To: Davis, J.Michael (J.Michael.Davis@nexteraenergy.com)
Cc: Catron, Steve (Steve.Catron@fpl.com); Kilby, Gary; 'laura.swenzinski@nexteraenergy.com'; Probst, Jim; Murrell, Bob (Bob.Murrell@nexteraenergy.com); Weaver, Tracy
Subject: Draft request for additional information (RAI) - Duane Arnold Energy Center (DAEC) - LAR TSCR-166, Adoption of EAL Scheme Pursuant to NEI 99-01 - EPID L-2017-LLA-0420
Attachments: DAEC Additional Comments.docx

Dear Mr. Davis,

By letter dated December 15, 2017, NextEra Energy Duane Arnold LLC (the licensee) requested approval for an emergency action level (EAL) scheme change for Duane Arnold Energy Center (DAEC), (Agencywide Documents Access and Management System (ADAMS) Accession Number ML17363A067 [package]).

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. DAEC proposes to revise their current EAL scheme to one based upon NEI 99-01, Revision 6.

The request for additional information (RAI) listed below is necessary to facilitate the 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 this draft RAI is requested in order to meet the proposed deadline requested by the licensee.

DAEC RAI-01

Section 4.4 of NEI 99-01, Revision 6, states that alternative methods for presenting EAL scheme information may be developed for use provided that it contains all the information needed to make a correct emergency classification. This information includes the Initiating Conditions, Operating Mode Applicability criteria, EALs, and Notes. DAEC provides a Hot Classification Matrix and a Cold Classification Matrix as alternative presentation methods.

a. The DAEC EAL alternative method for presenting EAL scheme information does not include the notes as provided in the proposed EAL Technical Basis document. This could lead to inaccurate or delayed emergency classifications. Please revise the DAEC Hot and Cold Matrices to include the applicable notes as described in NEI 99-01, Revision 6, or provide justification for omission.

b. The DAEC EAL alternative method for presenting EAL scheme information is not consistent with the proposed EAL Technical Basis document. This could lead to inaccurate or delayed emergency classifications. A partial list of examples of inconsistencies are as follows: (NOTE: These items should not be considered a complete list of potential inconsistencies.)

- Fuel clad damage assessment corresponding to Containment Barrier Potential Loss 5A provides a value of 5% vice the value of 20% which is provided in the technical basis document.
- SA1.1 provides “AC power capability to 1A3 and 1A3” vice “AC power capability to 1A3 and 1A4 buses.”
- Table E-1 Cask On-Contact Dose Rates implies all readings should be taken On-Contact vice three feet from the HSM [horizontal storage module].
- The tables used on the alternate method for presenting EAL scheme information have different layouts and titles than the technical basis document tables. In some cases, there is no corresponding technical basis document table. (see attached table of additional comments)

Please review the DAEC EAL alternative method for presenting EAL scheme information and ensure the method is technically accurate and addresses human factors issues that could impact timely and accurate EAL assessments.

DAEC RAI-02

On Page 17, the proposed DAEC Section 5.1, “General Considerations,” state:

> As used here, “promptly” means at the first available opportunity (e.g., if the Shift Manager is receiving an update from the fire brigade at the 15-minute mark, it is expected that the declaration will occur as the next action after the call ends).

The above statement could infer that it is acceptable for the Shift Manager to make the EAL declaration after the 15-minute mark, if the Shift Manager was on the phone or otherwise busy. Guidance in Section IV.H.8 to NSIR/DPR-ISG-01, “Emergency Staff Guidance for Nuclear Power Plants,” provides that delays beyond 15 minutes could be found compliant under the following conditions:

- The delay was caused by a licensee actively performing another action immediately needed to protect the public health and safety such that a delay in declaration qualitatively represents the lesser risk.

- The cause of the delay was not reasonably within the licensee’s ability to foresee and prevent.

Based on the NRC guidance cited above, unless the Shift Manager was performing actions immediately needed to protect public health and safety, it would be reasonable to expect him to obtain the required information needed to make a declaration within 15 minutes of the initiation of the event. Please explain how the Shift Manager/Emergency Director would not potentially infer that it is acceptable to make a declaration greater than 15 minutes from the initial detection of a fire, or revise accordingly to align with NRC guidance.

DAEC RAI-03

The proposed DAEC EAL RA1.1, RS1.1, and RG1.1 have values for the Offgas Stack radiation monitor that were rounded from 4.45Exx to 4.5Exx and the Turbine Building ventilation radiation monitor setpoint was rounded from 1.44Exx to 1.0Exx. This could result in a difference of approximately 50% for the Turbine building ventilation radiation monitors. The staff could not determine why apparently different rounding methodologies were used for the Offgas Stack and Turbine Building ventilation radiation monitors. Please explain the basis used for the apparently different rounding methodologies or revise accordingly.

DAEC RAI-04

NEI 99-01, Revision 6, EAL CU1 is intended to result in the declaration of a Notification of Unusual Event (Unusual Event) if there is an unplanned loss of reactor pressure vessel (RPV) inventory that results in a RPV level below a minimum operating level required by the governing procedure for greater than 15 minutes. DAEC

proposes to use this threshold value only when RPV level is below the RPV flange. Please explain what unique DAEC conditions require this deviation from proposed guidance for CU1.1 or revise accordingly.

DAEC RAI-05

The proposed DAEC EALs CU4. SS2.1, and SG2.1.b use 105 VDC for the threshold value. However, the Developer's Notes for these threshold values provides at least a 15 minute margin for a minimum DC voltage. The DAEC basis for the threshold value states that the inverter has an auto trip at 105 VDC decreasing. As such, this threshold value would provide no margin. Please explain why the DAEC threshold values for CU4 and SS2.1 and SG2.1.b were not developed above the inverter auto trip setpoint to allow for with a 15 minute margin, or revise accordingly.

DAEC RAI-06

The proposed EALs CA6 and SA8 are intended to result in the declaration of an Alert classification if a hazardous event resulted in degraded performance to one train of a safety system, with either visible damage to or degraded performance of a second train of safety equipment. The proposed DAEC EALs CA6 and SA8 include the following threshold value that that does not appear to be consistent with the overall intent for these EALs: "Loss of the safety function of a single train SAFETY SYSTEM." It was not apparent where such that a single support system issue would compromise public health and safety during a radiological event. As such, please explain which single safety systems would result in compromising public health and safety during a radiological event if they were compromised, or revise accordingly. As provided, DAEC EALs CA6 and SA8 are neither consistent with NEI 99-01, Revision 6, nor with the guidance provided by EPFAQ 2016-02, "Clarification of Equipment Damage as a Result of a Hazardous Event" (ADAMS Accession No. ML17195A299). Please explain what specific design DAEC features preclude using the guidance provided by EPFAQ 2016-02, or revise accordingly to preclude a possible unwarranted event classification.

DAEC RAI-07

The proposed DAEC EAL threshold values for CS1.3.b and CG1.2.b include "Erratic source range indication" as a core uncover[y] indication. This indication is typically applicable to pressurized water (PWR) reactors and not boiling water reactors (BWR). Please justify using a threshold value that is typically applicable to a PWR for DAEC, which is a BWR, or revise accordingly.

DAEC RAI-08

The proposed DAEC EAL threshold values for fission product barrier degradation, based on containment radiation monitors, do not appear appropriate. Considering that the Fuel Clad Loss threshold value should correspond to 2% to 5% clad damage, and the Containment Barrier Potential Loss threshold value should be 20% (as provided by NEI 99-01, Revision 6), it would be reasonable for the radiation values to be different by a factor of 4 to 10. However, the value for the Containment Barrier Loss drywell radiation monitor reading is 25 times higher than the Primary Containment Loss radiation monitor reading, while the corresponding Torus Radiation Monitor reading for a Containment Barrier Potential Loss is 2.5 times the Fuel Clad Barrier Loss threshold value. Additionally, it appears the Fuel Clad Barrier Loss was developed based on an intact RCS, which is not consistent with the guidance provided by NEI 99-01, Revision 6, or the DAEC Technical Basis for the Torus Radiation Monitor Containment Loss threshold value, which is based on a loss of RCS inventory. Please verify that the Fuel Clad Barrier threshold values for the Drywell and Torus radiation monitors are based on a loss of the RCS with between approximately 2% and 5% clad damage and that the Containment Barrier Potential Loss radiation monitors are based on approximately 20% clad damage, or revise accordingly.

DAEC RAI-9

The proposed DAEC EAL HU3 includes threshold values that do not appear to be consistent with the overall intent of EAL HU3 to address hazardous events, including a threshold value for high river level and a River Water Supply (RWS) pit low level alarm. Considering that internal room or area flooding is specifically addressed by HU3.2, the threshold value for river level appears redundant. Additionally, a high river level alone

may, or may not, involve internal room or area flooding. Although a RWS pit low level alarm may be the result of a hazardous event, the RWS pit low level condition does not appear to represent an actual hazardous event. Please verify whether a high river level or a river water supply pit low level alarm should be considered as hazardous events, or revise accordingly.

DAEC RAI-10

The proposed DAEC EAL HU4.2 is intended to provide licensees thirty (30) minutes to validate whether or not a single fire alarm is valid. BWRs typically inert the Drywell and Torus when at power. DAEC EAL HU4.2 does not appear to have a note or other statement that indicates that an Unusual Event should not be declared if the Drywell and Torus are inerted. Please verify that there is a need to declare DAEC EAL HU4 for containment if the DAEC Drywell and Torus are inerted, or revise accordingly.

Please arrange a teleconference with the NRC staff to discuss this information. In case of any questions, please contact me. Thanks

Mahesh Chawla
Division of Reactor Licensing
Branch LPL-3
(301) 415-8371
Mahesh.chawla@nrc.gov

Hearing Identifier: NRR_DMPS
Email Number: 423

Mail Envelope Properties (Mahesh.Chawla@nrc.gov20180615100800)

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From: Chawla, Mahesh

Created By: Mahesh.Chawla@nrc.gov

Recipients:
"Catron, Steve (Steve.Catron@fpl.com)" <Steve.Catron@fpl.com>
Tracking Status: None
"Kilby, Gary" <Gary.Kilby@fpl.com>
Tracking Status: None
"'laura.swenzinski@nexteraenergy.com'" <laura.swenzinski@nexteraenergy.com>
Tracking Status: None
"Probst, Jim" <Jim.Probst@nexteraenergy.com>
Tracking Status: None
"Murrell, Bob (Bob.Murrell@nexteraenergy.com)" <Bob.Murrell@nexteraenergy.com>
Tracking Status: None
"Weaver, Tracy" <Tracy.Weaver@nexteraenergy.com>
Tracking Status: None
"Davis, J.Michael (J.Michael.Davis@nexteraenergy.com)" <J.Michael.Davis@nexteraenergy.com>
Tracking Status: None

Post Office:

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MESSAGE	11640	6/15/2018 10:08:00 AM
DAEC Additional Comments.docx	25532	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

The following are differences between Attachment 2 (Clean Copy) and Operator's classification matrix.

EAL	Basis Document	Classification Matrix
RU1.1 RA1.1 Change NOUE to ALERT RS1.1 Change NOUE to SAE RG1.1 Change NOUE to GE	Reading on **ANY** of the following effluent radiation monitors greater than the reading shown for 60 minutes or longer:	Reading on **ANY** Table R-1 effluent radiation monitor greater than column "NOUE" for 60 minutes or longer.
RU1 Table R1 Title RA1 Table R1 Title RS1 Table R1 Title RG1 Table R1 Title	**Effluent Monitor Classification Thresholds**	**Table R-1 - Effluent Monitor Classification Thresholds**
RA3.1 First Bullet	Control Room ARM (RM-9162)	Control Room (RM-9162)
RS1.3	Closed window dose rates greater than 100 mR/hr expected to continue for 60 minutes or longer. Analyses of field survey samples indicate thyroid CDE greater than 500 mrem for one hour of inhalation.	Closed window dose rates greater than 100 mR/hr expected to continue for greater than or equal to 60 min. Analyses of field survey samples indicate thyroid CDE greater than 500 mrem for 60 min. of inhalation.
RS2 IC	Spent fuel pool level at 16.36 feet.	Spent fuel pool level at the top of the fuel racks
RG1.3	Closed window dose rates greater than 1,000 mR/hr expected to continue for 60 minutes or longer. Analyses of field survey samples indicate thyroid CDE greater than 5,000 mrem for one hour of inhalation.	Closed window dose rates greater than 1000 mR/hr expected to continue for greater than or equal to 60 min Analyses of field survey samples indicate thyroid CDE greater than 5000 mrem for 60 min. of inhalation
CU1 IC	UNPLANNED loss of RPV inventory for 15 minutes or longer.	UNPLANNED loss of RCS inventory for 15 minutes or longer
CU2.1.a	AC power capability to 1A3 and 1A4 buses is reduced to a single power source for 15 minutes or longer.	AC power capability to 1A3 and 1A4 is reduced to a single power source for 15 minutes or longer
CA1 IC	Loss of RPV inventory.	Loss of RCS inventory
CA2 IC	Loss of all offsite and all onsite AC power to essential buses for 15 minutes or longer.	Loss of all offsite and all onsite AC power to essential buses for greater than 15 minutes

CA3.1	UNPLANNED increase in RCS temperature to greater than 212°F for greater than the duration specified in the following table.	UNPLANNED increase in RCS temperature to greater than 212°F for greater than the duration specified in Table C-2.
CA3.1 Table Title	Table: RCS Heat-up Duration Thresholds	Table C-2 RCS Heat-up Duration Thresholds
CA3.1 Table Heat-up Duration	60 minutes* 20 minutes* 0 minutes	60 min. * 20 min. * 0 min.
CA3.1 Table Containment Closure Status Intact	Not applicable	N/A
CA6.1	The occurrence of **ANY** of the following hazardous events:	The occurrence of **ANY** of the Table C-3 hazardous events:
CA6.1 Table C-3	*Events listed*	*Table C-3*
CS1 IC	Loss of RPV inventory affecting core decay heat removal capability.	Loss of RCS inventory affecting core decay heat removal capability
CG1 IC	Loss of RPV inventory affecting fuel clad integrity with containment challenged.	Loss of RCS inventory affecting fuel clad integrity with containment challenged
CG1.1.b	ANY indication from the Secondary Containment Challenge Table (see below).	ANY indication from the Secondary Containment Challenge Table C-1
CG1.2.b third bullet	UNPLANNED level rise in Drywell/Reactor Building Equipment or Floor Drain sump, or Suppression Pool of sufficient magnitude to indicate core uncovery	UNPLANNED level rise in Drywell/Reactor Building Equipment or Floor Drain sump, or Suppression Pool of sufficient levels to indicate core uncovery.
E-HU1.1	Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading greater than the values shown below on the surface of the spent fuel cask.	Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading greater than the values shown on Table E-1 on the surface of the spent fuel cask.
E-HU1 Table Title		Table E-1 Cask On-Contact Dose Rates
FG1 IC	Loss of **ANY** two barriers and Loss OR Potential Loss of the third barrier.	Loss of **ANY** two barriers and Loss or Potential Loss of third barrier.
FA1 IC	**ANY** Loss or **ANY** Potential Loss of either the Fuel Clad OR RCS barrier.	**ANY** Loss or **ANY** Potential Loss of either Fuel Clad OR RCS barrier.
HU2 IC	Seismic event greater than OBE levels.	Seismic event greater than OBE level

HU4 Table H-1 Title	Table H-1 Safe Shutdown/Vital Areas	Table H-1 Fire Areas
HU4 Table H-1	*Broken into categories*	*One continuous list*
HU6 IC	Other conditions exist which in the judgment of the Emergency Director warrant declaration of a NOUE.	Other conditions exist which in the judgment of the Emergency Director warrant declaration of a UE
SU3.1.a	An UNPLANNED event results in the inability to monitor one or more of the following parameters from within the Control Room for 15 minutes or longer.	An UNPLANNED event results in the inability to monitor one or more of the Table S-1 parameters from within the Control Room for 15 minutes or longer.
SU3.1.a Table S-1	*List with six bullets*	*Table S-1*
SU6.2.b.1	ANY of the following subsequent manual actions taken at 1C05 are successful in lowering reactor power below 5% power	ANY of the following manual actions taken at 1C05 are successful in lowering reactor power below 5% power.
SA3.1.a & b	a. An UNPLANNED event results in the inability to monitor one or more of the following parameters from within the Control Room for 15 minutes or longer. b. **ANY** of the following transient events in progress.	a. An UNPLANNED event results in the inability to monitor one or more Table S-1 parameters from within the Control Room for 15 minutes or longer. b. **ANY** of the Table S-2 transient events are in progress.
SA3 Table S-1 & S-2	*List with bullets*	*Table S-1 and S-2*
SA8.1.a	The occurrence of **ANY** of the following hazardous events:	The occurrence of **ANY** of the Table S-3 hazardous events:
SA8 Table S-3	*List with bullets*	*Table S-3*
SS6 IC	Inability to shutdown the reactor causing a challenge to RPV water level or RCS heat removal.	Inability to shutdown the reactor causing a challenge to core cooling or RCS heat removal
SG1.1.a	Loss of **ALL** offsite and **ALL** onsite AC power to 1A3 and 1A4 buses.	Loss of **ALL** offsite and **ALL** onsite AC power to 1A3 and 1A4
SG1.1.b	**EITHER** of the following:	**EITHER:**

During the review of Attachment 2 (Clean Copy), the following typographical errors were found:

Page/Paragraph	Error
49 1st paragraph	"RSC" instead of "RCS"
56 3rd paragraph	Paragraph ends with three periods
79 3rd and 4th paragraphs	Paragraphs end with two periods

The following items are discrepancies in Attachment 2 (Clean Copy) that should considered.

Section	Discrepancy
5.3	DAEC is a one unit site however, this paragraph describes actions for a two unit site (two places).
CG1 basis 2nd paragraph	The verbiage uses the PWR wording i.e. “If RCS/reactor vessel level cannot be restored…” should be “If reactor vessel level…”
RC5.A Loss or Potential Loss basis page 71	This paragraph is from the Developer’s Notes and should not be included.
SU6 [SU5] basis 2nd paragraph	The verbiage uses the PWR wording “initiate a reactor trip.” This should be a reactor scram.