## NRR-DMPSPEm Resource

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| **From:** | Chawla, Mahesh |
| **Sent:** | Wednesday, March 28, 2018 5:12 PM |
| **To:** | Davis, J.Michael (J.Michael.Davis@nexteraenergy.com) |
| **Cc:** | 'laura.swenzinski@nexteraenergy.com'; Catron, Steve (Steve.Catron@fpl.com); Kilby, Gary; Murrell, Bob (Bob.Murrell@nexteraenergy.com); Probst, Jim; Weaver, Tracy |
| **Subject:** | Final RAI for Duane Arnold (DAEC) Re: 5th-10 year ISI (RR-05) (EPID L-2017-LLR-0140) |
| **Attachments:** | EPID L-2017-LLR-0140 - Final RAIs - RR05.docx |

Dear Mr. Davis:

By letter dated November 16, 2017, (ADAMS Accession No. ML17325B215) NextEra Energy Duane Arnold, LLC (the licensee) submitted a relief request (RR) as part of the Fifth-10 year Inservice Inspection Interval Program Plan for Duane Arnold Energy Center (DAEC). The RR, designated as RR-05, is being requested in order for DAEC to continue the implementation of the previously approved Risk-Informed Inservice Inspection Program (RI-ISI), as an alternative to the current ASME Code Section XI requirements.

On March 13, 2018, the U.S. Nuclear Regulatory Commission (NRC) staff sent you a draft request for additional information identifying the additional information needed to complete its review. On March 28, 2018, a teleconference was held between the NRC staff and your representatives to providing any clarification needed for the request for additional information (RAI). During the teleconference, your representatives acknowledged a clear understanding of the requested information.

Attached, please find the final RAI. Please provide your written response on the docket prior to 30 days from the receipt of this email, as agreed upon by your representative.

Thank you for your attention.

Mahesh (Mac) Chawla
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**Hearing Identifier:** NRR_DMPS
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**Subject:** Final RAI for Duane Arnold (DAEC) Re: 5th-10 year ISI (RR-05) (EPID L-2017-LLR-0140)
**Sent Date:** 3/28/2018 5:11:40 PM
**Received Date:** 3/28/2018 5:11:00 PM
**From:** Chawla, Mahesh

**Created By:** Mahesh.Chawla@nrc.gov

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**Post Office:**

| **Files** | **Size** | **Date & Time** |
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| EPID L-2017-LLR-0140 - Final RAIs - RR05.docx | 31271 | |

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**Sensitivity:** Normal
**Expiration Date:**
**Recipients Received:**

Request for Additional Information

Re: Duane Arnold Energy Center

Fifth-10 Year Inservice Inspection Interval Program Plan

Relief Request No. RR-05

Docket No. 50-331

By letter dated November 16, 2017 (ADAMS Accession No. ML17325B215), NextEra Energy Duane Arnold, LLC (the licensee) submitted a relief request (RR), as part of the Fifth-10 year Inservice Inspection Interval Program Plan for Duane Arnold Energy Center (DAEC). RR-05 is being requested in order for DAEC to continue the implementation of the previously approved Risk-Informed Inservice Inspection Program (RI-ISI), as an alternative to the current requirements of Class 1 and 2 examination Categories B-F, B-J, C-F-1, and C-F-2 as specified in Table IWB 2500-1, and Table IWC 2500-1 of the 2007 Edition with 2008 Addenda of ASME Code Section XI.

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing your proposed request and has identified an area where additional information is needed to complete its review. The following requests for additional information (RAIs) require licensee responses:

**APLA-RAI-01**

In DAEC RR-05 submittal, page 5, "Risk Impact Analysis," the licensee states, in part:

> The revised program continues to be less than the EPRI criterion with a total change in plant risk of 4.34E-09 in regards to CDF and 4.3E-09 in regards to LERF.

NRC Staff Request:

a. Regarding the statement above, since LERF is typically at least an order of magnitude lower than CDF, explain why the total changes in CDF and LERF are essentially equal.

b. Explain why the 03RWCU System parameter (exhibited in the Risk Impact Results matrix), on page 5, has a change in LERF exceeding that of CDF. The NRC staff is requesting clarification in the data set since CDF values would typically be greater than LERF values.

**APLA-RAI-02**

According to Regulatory Issue Summary 2007-06, the NRC would expect licensees to fully address all scope elements consistent with Revision 2 of Regulatory Guide (RG) 1.200 by the end of 2009 (i.e., one year implementation period). Revision 2 of RG 1.200 endorses, with exceptions and clarifications, the combined American Society of Mechanical Engineers (ASME)/American Nuclear Society (ANS) PRA standard (ASME/ANS RA-Sa-2009).

In Attachment 2, "DAEC PRA Model Quality Summary," page 2 (of the submittal), the licensee states, in part:

> The focused scope peer review conducted in March 2011 …utilized version RA-Sa-2009 of the ASME Standard as endorsed and clarified by the NRC in Regulatory Guide 1.200, Revision 2.

NRC Staff Request:

The NRC staff is requesting the licensee to confirm that all technical elements in Part 2 of the Standard, including internal flooding, were included in this March 2011 review. If not, please identify any gaps between the peer review and the requirements in RG 1.200, Revision 2, particularly focusing on those technical elements for which the most current peer review remains from 2007 against Rev. 1 of RG 1.200.

**APLA-RAI-03**

The NRC staff identified during its review the need for the licensee to further address several previously identified gaps that were incorporated into the DAEC PRA. Specifically, more information is requested re: DAEC Focused Peer Review Findings (Table C-1) which include:

a. Findings & Observations (F&O) DA-D4-01A, which the licensee states, in part:

> To address this associated finding, the reasonableness of the prior and posterior distributions was reviewed; it was concluded no model changes were required.

This implies that the mean of the likelihood (3/544 = 0.0055) was significantly higher (a factor of 60) than that for the prior (9E-5). The NRC staff determined this may suggest a Bayesian approach may not be appropriate if plant-specific behavior is significantly different (worse) than generic.

NRC Staff Request:

Did these values change subsequently such that the focused scope review had different values where the prior and likelihood were more aligned? Provide the results of the final Bayesian analysis and the conclusion by the peer review team that this Supporting Requirement (SR) is now MET.

b. F&O IE-B3-01A, which the licensee states, in part:

> Several findings and suggestions under HLR-A and HLR-B have been dispositioned / resolved, but the subsuming (IE-B3) and screening (IE-C4 (C6)) of initiating events does not meet the standard.

In particular, the Finding cited, (1) RBCCW is subsumed by TT, but not failed given TT; (2) GSW is subsumed by TC, but not failed given TC; (3) 1A1/1A2 bus failures and partial loss of feedwater are binned to TT, but their impact not modeled given TT; and (4) 1A3/1A4 bus failures are subsumed with TT, but unavailability of emergency power given failure of the bus. Additionally, the licensee stated that the CDF is 3.5E-09/yr.

NRC Staff Request:

Provide the NRC staff with information regarding these deficiencies due to subsuming, specifically are they rectified? Additionally, the information provided in the disposition cites conservatisms with respect to piping leg breaks not yet incorporated into the model. It is not clear to the NRC staff if any sequences initiated by or subsequently involving these breaks could be affected by the application such that failure to incorporate these into the PRA could underestimate the change in CDF or LERF. If so, provide information (e.g., a sensitivity evaluation) that includes these into the applicable risk metrics and determine any effect.

c. F&O HR-A1-01A and F&O HR-A2-01A, which the licensee states, in part:

> The approach used in the DAEC PRA was different than currently prescribed in the standard, but is considered capable of accurately identifying pre-initiators. As such this variance from the standard has no impact on this application.

NRC Staff Request:

Provide the NRC staff with information regarding why the use of this "different approach", as stated above, accurately identifies pre-initiators such that it is equivalent to the approach required by the Standard (ASME/ANS RA-Sa-2009).

d. F&O HR-C1-01A, which the licensee states, in part:

> In other cases, the [Human Failure Events] HFE is at the train level, but no corresponding system level dependent HFE is included.

NRC Staff Request:

The F&O disposition cites addition of train-level pre-initiating HFEs to the model. However, it is not clear to the NRC staff if this deficiency regarding "corresponding system-level dependent HFEs" has been corrected as well. If not, provide the NRC staff with information (e.g., performance of a sensitivity evaluation) incorporating these dependencies and assess any effect on the risk metrics.

**APLA-RAI-04**

The NRC staff identified during its review of the licensee's source material regarding the RI-ISI consequence evaluation (Table C-2), that several items exhibited in the matrix required additional information, including:

a. For Item No. 49, the licensee states, in part:

> Given that Level 2 results are often the determining parameter for assignment of consequence category in the RI-ISI evaluation, this item is judged to have little influence on its results.

NRC Staff Request:

Provide the NRC staff with information regarding the stated term “little influence” and justify why any such influence would not affect the risk metrics appropriate for this application in any detrimental way.

b. For Item No. 58, there is no information provided in either the Status or Estimated RI-ISI Impact columns of the matrix.

NRC Staff Request:

Provide this information for Item No. 58, or justify to the NRC staff why there is no information.

c. For Item No. 59, the licensee states, in part:

> The subject gate [RCIC-07-01] is a very low contributor to RCIC system failure. Therefore this item has essentially no influence on the RI-ISI application.

NRC Staff Request:

Provide the NRC staff with information regarding any effect from the retention of gate RCIC-07-01 that could lead to an underestimate of any of the applicable risk metrics for this application.

d. For Item No. 63, the licensee states, in part:

> Modeling of water hammer is very low contributor to HPCI and RCIC system failure.

NRC Staff Request:

Provide the NRC staff with information regarding the basis for the statement above (e.g., what are the failure likelihoods for HPCI and RCIC currently modeled and how do they compare with the likely value for water hammer).

e. For Item No. 64, the licensee states, in part:

> The current treatment of human actions to manage water level following plant trips, including ATWS, is believed to be overly conservative and would benefit from refinement. The current model is conservative for the RI-ISI application with respect to this time.

NRC Staff Request:

Provide the NRC staff with information regarding any potential dependencies among these separate events, such that the current combined failure probability may be under-estimated if these dependencies are not modeled. If so, provide a quantitative evaluation (e.g., a sensitivity evaluation) addressing any potential dependencies.

**APLA-RAI-05**

The NRC staff's review of the licensee's source material regarding plant modifications assessed as potentially having a PRA impact (Table C-3), that EC No. 156110, "Installation of Well Water Isolation Valve V44-0509," requires additional information:

For EC No. 156110, the licensee states, in part:

> This is acceptable based on low safety significance of well water system isolation valves.

<u>NRC Staff Request:</u>

Provide the NRC staff with information regarding if the use of the above stated term "low safety significance" includes "low risk importance" such that the exclusion remains justified for this application.