



June 5, 2018

NG-18-0068
10 CFR 50.55a

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Duane Arnold Energy Center
Docket No. 50-331
Renewed Op. License No. DPR-49

Supplemental Response to Request for Additional Information, Fifth Inservice Inspection Interval Program Plan, Relief Request RR-05

- References: 1) Letter, Curtland (NextEra) to U.S. NRC, "Fifth Inservice Inspection Interval Program Plan, Relief Request No. RR-05," dated November 16, 2017 (ML17325B215)
2) Electronic Communication, Final RAI for Duane Arnold (DAEC) Re: 5th – 10 year ISI (RR-05), dated March 28, 2018
3) Letter, Curtland (NextEra) to U. S. NRC, "Response to Request for Additional Information, Fifth Inservice Inspection Interval Program Plan, Relief Request RR-05," dated April 27, 2018 (ML18117A204).

In the Reference 1 letter, NextEra Energy Duane Arnold, LLC (hereafter NextEra Energy Duane Arnold) submitted Relief Request RR-05 in support of our Fifth Inservice Inspection Interval Program Plan pursuant to 10 CFR 50.55a. The NRC Staff requested, via Reference 2, additional information regarding Relief Request RR-05. NextEra Energy Duane Arnold provided that additional information in the Reference 3 letter. Subsequent discussion with the NRC Staff has identified the need for a supplemental response regarding Relief Request RR-05.

The Enclosure to this letter contains information that supplements that provided in Reference 3.

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This letter does not contain any new or revised commitments.

If you have any questions or require additional information, please contact J. Michael Davis at 319-851-7032.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on June 5, 2018

A handwritten signature in black ink, appearing to read "Dean Curtland". The signature is fluid and cursive, with a large initial "D" and "C".

Dean Curtland
Site Director
NextEra Energy Duane Arnold, LLC

Enclosure

cc: NRC Regional Administrator
NRC Resident Inspector
NRC Project Manager

Enclosure to NG-18-0068

Supplemental Response to Request for Additional Information, Fifth Inservice
Inspection Interval Program Plan, Relief Request RR-05

3 pages follow

1.0 INTRODUCTION

In the Reference 1 letter, NextEra Energy Duane Arnold, LLC (hereafter NextEra Energy Duane Arnold) submitted Relief Request RR-05 in support of our Fifth Inservice Inspection Interval Program Plan pursuant to 10 CFR 50.55a. The NRC Staff requested, via Reference 2, additional information regarding Relief Request RR-05. NextEra Energy Duane Arnold provided that additional information in the Reference 3 letter. Subsequent discussion with the NRC Staff has identified the need for a supplemental response regarding Relief Request RR-05. The supplemental information is given below.

2.0 SUPPLEMENTAL INFORMATION RELATED TO APLA-RAI-03(a)

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:

APLA-RAI-03(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.

DAEC Supplemental Information to Original Response:

The mean values used in the Bayesian update and cited in the finding did not change when the focused scope review was performed. The Bayesian update results for the specific Type Code that used the above mean data inputs, Type Code AS1KFR, are provided in the table below.

TYPE CODE	DESCRIPTION	Distribution	Prior			Data		Posterior			
			mean	alpha or Error Factor	beta	events	hours/demands	alpha or Error Factor	beta	mean	variance or Error Factor
AS1KFR	Air Compressor Fails To Continue Running	Gamma	9.16E-05	1.423	15530	3	544.73	4.423	16074.73	2.75E-04	1.71E-08

The relevant supporting requirement, DA-D4, was found to be met at Capability Category I in DAEC's 2007 full-scope peer review and again in DAEC's 2011 focused-scope peer review. The DA-D4 SR was never classified as a "not met". Significant additional review and assessment was performed by DAEC to improve upon the CCI status and further justify the use of the updated data. Further review of F&O DA-D4-01A found its Bayesian update statistical analysis of plant specific failure rates to be consistent with industry PRA techniques and with the ANS/ASME PRA Standard. Generic industry data failure rate distributions were judged to be applicable to DAEC because the data was collected from similar plants, was collected consistently, and represented a sizable data population. Twelve type codes, including the one cited in the finding, had posterior means greater than 50% of their prior means. A sensitivity PRA case was performed where the plant specific failure rates for these type codes were substituted for posterior mean values contained in the PRA basic event database. Use of only the plant specific evidence was considered very conservative because of the limited sample size of much of the data. The core damage frequency was shown not to be sensitive to the assumed increase in associated basic event failure probabilities. Based on this result, the original posterior mean values were judged to be acceptable and were not changed.

NextEra Energy Duane Arnold's resolution to F&O DA-D4-01A, which involves addressing DA-D4 at the Capability Category II/III level, was assessed by an independent closure review of open F&Os in July of 2017. The review was performed in accordance with the process documented in Appendix X to NEI 05-04, as well as the requirements published in the ASME/ANS PRA Standard (RA-Sa-2009) and Regulatory Guide 1.200, Revision 2. The review team concluded that the DA-D4-01A resolution was acceptable for closure as noted in the review report and provided below.

The F&O finding identified that prior and posterior data needed to be reviewed for reasonableness, particularly because of data associated with type code AS1KFR (standby air compressor failure to run). The reasonableness of the prior and posterior distributions was reviewed by DAEC and it was concluded that no model changes were required. The evaluation was documented in Supplement 1 to the DAEC PRA Data Analysis Notebook DA-08. This supplement was reviewed by the independent review team and found that it provides a comprehensive review and documentation of the reasonableness of the data inputs. Generic

industry data failure rate distributions were judged to be applicable to DAEC because the data was collected from similar plants, was collected consistently, and represented a sizable population of data. Plant data which indicate no failures were assumed to be reasonable for use in Bayesian updates of the priors. Posterior means that were within 50% of the prior means were judged to be a reasonable posterior update. Posterior means that were greater than 50% of the prior means were also considered reasonable after performing a sensitivity analysis on the model. The review team concluded that this finding resolution is adequate and complete.

Although Capability Category II/III requirements are satisfied, it is noted that DA-D4 at the Capability Category I level is deemed sufficient for RI-ISI applications according to EPRI Report 1021467, "Nondestructive Evaluation: Probabilistic Risk Assessment Technical Adequacy Guidance for Risk-Informed In-Service Inspection Programs," dated July 2010.

3.0 REFERENCES

1. Letter, Curtland (NextEra) to U.S. NRC, "Fifth Inservice Inspection Interval Program Plan, Relief Request No. RR-05," dated November 16, 2017 (ML17325B215).
2. Electronic Communication, Final RAI for Duane Arnold (DAEC) Re: 5th – 10 year ISI (RR-05), dated March 28, 2018.
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