



March 24, 2017

NG-17-0069
10 CFR 50.90

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

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

License Amendment Request (TSCR-169), Revision to Technical Specification Table 3.3.2.1-1, "Control Rod Block Instrumentation"

Pursuant to 10 CFR 50.90, NextEra Energy Duane Arnold, LLC (NextEra) is submitting a request for an amendment to the Technical Specifications (TS) for the Duane Arnold Energy Center (DAEC). The proposed change would relocate cycle specific Minimum Critical Power Ratio (MCPR) values to the DAEC Core Operating Limits Report (COLR).

The Enclosure to this letter provides NextEra's evaluation of the proposed change. Attachment 1 to the enclosure provides a markup of the TS showing the proposed changes, and Attachment 2 provides the clean TS pages containing the proposed TS changes. The changes to the TS Bases are provided for information only in Attachment 3 and will be incorporated in accordance with the TS Bases Control Program upon implementation of the approved amendment.

NextEra requests approval of the proposed license amendment by March 31, 2018, and implementation by September 27, 2018. This implementation date coincides with the next planned issuance of the COLR, which will occur prior to plant start up following the fall 2018 refueling outage.

In accordance with 10 CFR 50.91, a copy of this application with enclosures is being provided to the designated State of Iowa official.

As discussed in the Enclosure, the proposed change does not involve a significant hazards consideration pursuant to 10 CFR 50.92, and there are no significant environmental impacts associated with the change. The DAEC Onsite Review Group has reviewed the proposed license amendment request.

This letter contains no new or revised regulatory commitments.

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

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I declare under penalty of perjury that the foregoing is true and correct.

Executed on March 24, 2017



Dean Curtland
Site Director
NextEra Energy Duane Arnold, LLC

Enclosure

cc: Regional Administrator, USNRC, Region III,
Project Manager, USNRC, Duane Arnold Energy Center
Resident Inspector, USNRC, Duane Arnold Energy Center
A. Leek (State of Iowa)

**NEXTERA ENERGY DUANE ARNOLD, LLC
DUANE ARNOLD ENERGY CENTER**

**License Amendment Request (TSCR-169), Revision to Technical Specification
Table 3.3.2.1-1, "Control Rod Block Instrumentation"**

EVALUATION OF PROPOSED CHANGE

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- 2.0 DETAILED DESCRIPTION
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- 4.0 REGULATORY EVALUATION
 - 4.1 APPLICABLE REGULATORY REQUIREMENTS/CRITERIA
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- 6.0 REFERENCES

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- Attachment 1 - Proposed Technical Specification Changes (Mark-Up)
 - Attachment 2 - Revised Technical Specification Pages
 - Attachment 3 - Proposed Technical Specification Bases Changes (Mark-Up)

1.0 SUMMARY DESCRIPTION

NextEra Energy Duane Arnold, LLC (NextEra) hereby requests an amendment to the Duane Arnold Energy Center (DAEC) Technical Specifications (TS) to modify TS Table 3.3.2.1-1, "Control Rod Block Instrumentation." The proposed change would relocate cycle specific Minimum Critical Power Ratio (MCPR) values to the DAEC Core Operating Limits Report (COLR).

2.0 DETAILED DESCRIPTION

NextEra proposes the following changes to the DAEC TS:

1. Revise the notes associated with TS Table 3.3.2.1-1, "Control Rod Block Instrumentation," as shown below:
 - (a) THERMAL POWER \geq 30% and $<$ 65% RTP and MCPR $<$ ~~1.70~~ **less than the limit specified in the COLR.**
 - (b) THERMAL POWER \geq 65% and $<$ 85% RTP and MCPR $<$ ~~1.70~~ **less than the limit specified in the COLR.**
 - (c) THERMAL POWER \geq 85% and $<$ 90% RTP and MCPR $<$ ~~1.70~~ **less than the limit specified in the COLR.**
 - (d) THERMAL POWER \geq 90% RTP and MCPR $<$ ~~1.40~~ **less than the limit specified in the COLR.**
 - (e) THERMAL POWER \geq 30% and $<$ 90% RTP and MCPR $<$ ~~1.70~~ **less than the limit specified in the COLR.**

2. Revise TS 5.6.5, CORE OPERATING LIMITS REPORT (COLR) as shown below
 - a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:
 1. The Average Planar Linear Heat Generation Rate (APLHGR) for Specification 3.2.1;
 2. The Minimum Critical Power Ratio (MCPR) for Specification 3.2.2; and
 3. Exclusion Region in the Power/Flow Map for Specification 3.4.1.; **and**
 4. **The Minimum Critical Power Ratios (MCPR) in Table 3.3.2.1-1 for Specification 3.3.2.1.**

Relocation of the cycle-specific MCPRs to the COLR, which is controlled by TS 5.6.5, would provide NextEra the flexibility to revise cycle-specific MCPRs in accordance with

NRC-approved methodologies without the need for a license amendment. The COLR, including any mid-cycle revisions or supplements, is required to be submitted to the NRC for each reload cycle per TS 5.6.5.

This change also corrects a misspelling of the word "Ratio" in TS 5.6.5.2.a.2. This is an editorial correction with no impact on any technical requirements, so no further discussion of this change is necessary.

3.0 TECHNICAL EVALUATION

NRC Generic Letter (GL) 88-16, "Removal of Cycle-Specific Parameter Limits From Technical Specifications," [Reference 1] provides guidance to licensees for the removal of cycle dependent parameter limits from the TS provided these values are included in a COLR and are determined with NRC-approved methodologies referenced in the TS. The specific values of these limits may be modified by licensees, without affecting nuclear safety, provided that these changes are determined using an NRC-approved methodology and consistent with all applicable limits of the plant safety analysis that are addressed in the Final Safety Analysis Report. If any of the applicable limits of the safety analysis are not met, prior NRC approval of the change is required.

Control rod block instrumentation MCPR values are calculated as part of the reload core design licensing analyses in accordance with NRC-approved methods in NEDE-24011-P-A, General Electric Standard Application for Reactor Fuel (GESTAR II) [Reference 2]. Because the analyses are completed only two to three months prior to the start of the next refueling outage, a need to revise MCPR values for the next operating cycle would require submitting a license amendment request with a quick turnaround, placing an unnecessary burden on NextEra and NRC resources. Relocating the MCPR values to the COLR will allow NextEra to make cycle-specific changes that are consistent with NRC-approved methodologies and within limits of the safety analysis without the burdensome process of amending the TS. The TS will continue to establish limits for MCPR for the control rod block instrumentation while the specific values for MCPR are relocated to the COLR. Therefore, the requested changes are essentially administrative in nature, and the required level of safety will be maintained.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

- NRC GL 88-16 discusses that processing TS changes to update cycle-specific parameter limits each fuel cycle places an unnecessary burden on the licensee and the NRC if these limits are developed using an NRC-approved methodology. The GL provides an alternative that relocates the specific parameter values to the COLR provided the values are determined using an NRC-approved methodology and the TS require plant operation in accordance with the limits specified in the COLR.

- 10 CFR 50.36, Technical specifications - requires that the TS contain limiting conditions for operation, which are the lowest functional capability or performance levels of equipment required for safe operation of the facility.

The proposed changes are consistent with the above regulatory guidance and regulation.

4.2 Precedent

In January 2014, Columbia Generating station received approval to relocate the control rod block instrumentation MCPR values to the COLR as part of a change to implement a digital instrumentation system. [Reference 3]

The TS for the plants below contain notes comparable to those in the DAEC TS that establish limits on MCPR for the control rod block instrumentation. Similar to the proposed change to the DAEC TS, the TS below do not provide the specific value for the control rod block instrumentation MCPR but specify the limit for MCPR as "less than the limit specified in the COLR."

- Brunswick Unit 1 (ML062900525) and Unit 2 (ML062900536)
- Browns Ferry Unit 2 (ML052780020)
- Peach Bottom Unit 2 (ML052720266)
- Susquehanna Unit 1 (ML052720300) and Unit 2 (ML052720301)

4.3 No Significant Hazards Consideration

NextEra Energy Duane Arnold, LLC (NextEra) requests an amendment to the Duane Arnold Energy Center (DAEC) Technical Specifications (TS) to modify TS Table 3.3.2.1-1, "Control Rod Block Instrumentation." The proposed change would relocate cycle specific Minimum Critical Power Ratio (MCPR) values to the DAEC Core Operating Limits Report (COLR).

As required by 10 CFR 50.91(a), NextEra has evaluated the proposed change to the Duane Arnold TS using the criteria in 10 CFR 50.92 and determined that the proposed change does not involve a significant hazards consideration. An analysis of the issue of no significant hazards consideration is presented below.

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The proposed change is an administrative change that does not affect any plant systems, structures, or components designed for the prevention or mitigation of

previously evaluated accidents. No new equipment is added nor is installed equipment being changed or operated in a different manner.

Relocation of the Control Rod Block Instrumentation MCPR values to the COLR has no influence or impact on, nor does it contribute in any way to the probability or consequences of transients or accidents. The COLR will continue to be controlled by the NextEra programs and procedures that comply with TS 5.6.5. Transient analyses addressed in the Final Safety Analysis Report will continue to be performed in the same manner with respect to changes in the cycle-dependent parameters obtained from the use of NRC-approved reload design methodologies, which ensures that the transient evaluation of new reloads are bounded by previously accepted analyses.

Therefore, the proposed TS change does not involve an increase in the probability or consequences of a previously evaluated accident.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed administrative change does not involve any changes to the operation, testing, or maintenance of any safety-related, or otherwise important to safety systems. All systems important to safety will continue to be operated and maintained within their design bases. Relocation of the Control Rod Block Instrumentation MCPR values to the COLR has no influence or impact on new or different kind of accidents.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No

The margin of safety is not affected by the relocation of cycle-specific Control Rod Block Instrumentation MCPR values from the TS to the COLR. Appropriate measures exist to control the values of these cycle-specific limits since it is required by TS that only NRC-approved methods be used to determine the limits. The proposed change continues to require operation within the core thermal limits as obtained from NRC-approved reload design methodologies and the actions to be taken if a limit is exceeded remain unchanged, again, in accordance with existing TS.

Therefore, the proposed change has no impact to the margin of safety.

Based on the above, NextEra concludes that the proposed change presents no significant hazards consideration under the standards set forth in 10 CFR 50.92, and, accordingly, a finding of “no significant hazards consideration” is justified.

4.4 Conclusions

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATIONS

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

1. NRC Generic Letter 88-16, Removal of Cycle-Specific Parameter Limits from Technical Specifications, October 4, 1988.
2. Global Nuclear Fuels topical report NEDE-24011-P-A, (GESTAR II), Revision 23, September 2016.
3. Letter from Carl F. Lyon (NRC) to Mark E. Reddemann (Energy Northwest), “Columbia Generating Station – Issuance of Amendment RE: Implementation of Power Range Neutron Monitoring / Average Power Range Monitor / Rod Block Monitor / Technical Specifications/Maximum Extended Load Line Limit Analysis (PRNM / ARTS / MELLLA) (TAC NO. ME7905),” January 31, 2014 (ML 13317B623).

ATTACHMENT 1

Proposed Technical Specification Changes (Mark-Up)

Two pages follow

Control Rod Block Instrumentation 3.3.2.1

Table 3.3.2.1-1 (page 1 of 1)
Control Rod Block Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Rod Block Monitor				
a. Low Power Range - Upscale	(a)	2	SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.5	≤ 115.5/125 divisions of full scale
b. Intermediate Power Range - Upscale	(b)	2	SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.5	≤ 109.7/125 divisions of full scale
c. High Power Range - Upscale	(c),(d)	2	SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.5	≤ 105.9/125 divisions of full scale
d. Inop	(d),(e)	2	SR 3.3.2.1.1	NA
e. Downscale	(d),(e)	2	SR 3.3.2.1.1 SR 3.3.2.1.5	NA
f. Bypass Time Delay	(d),(e)	2	SR 3.3.2.1.1 SR 3.3.2.1.5	≤ 2.0 seconds
2. Rod Worth Minimizer	1 ^(f) , 2 ^(f)	1	SR 3.3.2.1.2 SR 3.3.2.1.3 SR 3.3.2.1.7	NA
3. Reactor Mode Switch – Shutdown Position	(g)	2	SR 3.3.2.1.6	NA

(a) THERMAL POWER ≥ 30% and < 65% RTP and MCPR < 1.70.

(b) THERMAL POWER ≥ 65% and < 85% RTP and MCPR < 1.70.

(c) THERMAL POWER ≥ 85% and < 90% RTP and MCPR < 1.70.

(d) THERMAL POWER ≥ 90% RTP and MCPR < 1.40.

(e) THERMAL POWER ≥ 30% and < 90% RTP and MCPR < 1.70.

(f) With THERMAL POWER ≤ 10% RTP, except during the reactor shutdown process if the coupling of each withdrawn control rod has been confirmed.

(g) Reactor mode switch in the shutdown position.

less than the limit specified
in the COLR

5.6 Reporting Requirements (continued)

5.6.3 Radioactive Material Release Report

The Radioactive Material Release Report covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of each year in accordance with 10 CFR 50.36a. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be consistent with the objectives outlined in the ODAM and Process Control Program and in conformance with 10 CFR 50.36a and 10 CFR Part 50, Appendix I, Section IV.B.1.

5.6.4 DELETED †5.6.5 CORE OPERATING LIMITS REPORT (COLR)

- a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:
1. The Average Planar Linear Heat Generation Rate (APLHGR) for Specification 3.2.1;
 2. The Minimum Critical Power Ratio (MCPR) for Specification 3.2.2; ~~and~~
 3. Exclusion Region in the Power/Flow Map for Specification 3.4.1; ~~←~~ ; and
- b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC in General Electric Standard Application for Reactor Fuel, NEDE-24011-P-A, (GESTAR II). The revision number is the one approved at the time the reload fuel analyses are performed.

4. The Minimum Critical Power Ratios (MCPR) in Table 3.3.2.1-1 for Specification 3.3.2.1.

(continued)

ATTACHMENT 2

Revised Technical Specification Pages

Two pages follow

Control Rod Block Instrumentation
3.3.2.1

Table 3.3.2.1-1 (page 1 of 1)
Control Rod Block Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Rod Block Monitor				
a. Low Power Range - Upscale	(a)	2	SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.5	≤ 115.5/125 divisions of full scale
b. Intermediate Power Range - Upscale	(b)	2	SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.5	≤ 109.7/125 divisions of full scale
c. High Power Range - Upscale	(c),(d)	2	SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.5	≤ 105.9/125 divisions of full scale
d. Inop	(d),(e)	2	SR 3.3.2.1.1	NA
e. Downscale	(d),(e)	2	SR 3.3.2.1.1 SR 3.3.2.1.5	NA
f. Bypass Time Delay	(d),(e)	2	SR 3.3.2.1.1 SR 3.3.2.1.5	≤ 2.0 seconds
2. Rod Worth Minimizer				
	1 ^(f) , 2 ^(f)	1	SR 3.3.2.1.2 SR 3.3.2.1.3 SR 3.3.2.1.7	NA
3. Reactor Mode Switch – Shutdown Position				
	(g)	2	SR 3.3.2.1.6	NA

(a) THERMAL POWER ≥ 30% and < 65% RTP and MCPR less than the limit specified in the COLR.

(b) THERMAL POWER ≥ 65% and < 85% RTP and MCPR less than the limit specified in the COLR.

(c) THERMAL POWER ≥ 85% and < 90% RTP and MCPR less than the limit specified in the COLR.

(d) THERMAL POWER ≥ 90% RTP and MCPR less than the limit specified in the COLR.

(e) THERMAL POWER ≥ 30% and < 90% RTP and MCPR less than the limit specified in the COLR.

(f) With THERMAL POWER ≤ 10% RTP, except during the reactor shutdown process if the coupling of each withdrawn control rod has been confirmed.

(g) Reactor mode switch in the shutdown position.

5.6 Reporting Requirements (continued)

5.6.3 Radioactive Material Release Report

The Radioactive Material Release Report covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of each year in accordance with 10 CFR 50.36a. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be consistent with the objectives outlined in the ODAM and Process Control Program and in conformance with 10 CFR 50.36a and 10 CFR Part 50, Appendix I, Section IV.B.1.

5.6.4 DELETED

5.6.5 CORE OPERATING LIMITS REPORT (COLR)

- a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:
 1. The Average Planar Linear Heat Generation Rate (APLHGR) for Specification 3.2.1;
 2. The Minimum Critical Power Ration (MCPR) for Specification 3.2.2;
 3. Exclusion Region in the Power/Flow Map for Specification 3.4.1; and
 4. The Minimum Critical Power Ratios (MCPR) in Table 3.3.2.1-1 for Specification 3.3.2.1.
- b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC in General Electric Standard Application for Reactor Fuel, NEDE-24011-P-A, (GESTAR II). The revision number is the one approved at the time the reload fuel analyses are performed.

(continued)

ATTACHMENT 3

Proposed Technical Specification Bases Changes (Mark-Up)

One page follows

BASES

greater than or equal to the limit specified in the COLR

APPLICABLE
SAFETY
ANALYSES,
LCO, and
APPLICABILITY

1. Rod Block Monitor (continued)

(Ref. 3). When operating < 90% RTP, analyses (Ref. 3) have shown that with an initial MCPR ≥ 1.70 , no RWE event will result in exceeding the MCPR SL. Also, the analyses demonstrate that when operating at $\geq 90\%$ RTP with MCPR ≥ 1.40 , no RWE event will result in exceeding the MCPR SL (Ref. 3). Therefore, under these conditions, the RBM is also not required to be OPERABLE.

2. Rod Worth Minimizer

The RWM enforces a rod pattern which is consistent with the Banked Position Withdrawal Sequence (BPWS) to ensure that the initial conditions of the CRDA analysis are not violated. The analytical methods and assumptions used in evaluating the CRDA are summarized in References 4, 5, 6, 7, and 11. The standard BPWS requires that control rods be moved in groups, with all control rods assigned to a specific group required to be within specified banked positions. Requirements that the control rod sequence is in compliance with the BPWS are specified in LCO 3.1.6, "Rod Pattern Control."

When performing a shutdown of the plant, an optional BPWS control rod sequence (Ref. 11) may be used if the coupling of each withdrawn control rod has been confirmed. The rods may be inserted without the need to stop at intermediate positions. When using the Reference 11 control rod insertion sequence for shutdown, the Rod Worth Minimizer may be reprogrammed to enforce the requirements of the improved BPWS control rod insertion process, or it can be bypassed if it is not programmed to reflect the optional BPWS shutdown sequence, as permitted by the Applicability Note for the RWM in Table 3.3.2.1-1.

The RWM Function satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

Since the RWM is a hardwired system designed to act as a backup to operator control of the rod sequences, only one channel of the RWM is available and required to be OPERABLE (Ref. 7). Special circumstances provided for in the Required Action of LCO 3.1.3, "Control Rod OPERABILITY," and LCO 3.1.6 may necessitate bypassing the RWM to allow continued operation with inoperable control rods, or to allow correction of a control rod

(continued)