



June 27, 2012

NG-12-0256  
10 CFR 50.90

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

Response to Request for Additional Information (RAI) Regarding License  
Amendment Request (TSCR-135): Application for One-Time Technical  
Specification Change Regarding Core Spray Operability during Shutdown

Reference: P. Wells (NextEra Energy Duane Arnold, LLC) to USNRC, "License Amendment Request (TSCR-135): Application for One-Time Technical Specification Change Regarding Core Spray Operability during Shutdown Section Affected: 3.3.5.1," NG-12-0167, dated May 1, 2012

In the Referenced letter, NextEra Energy Duane Arnold, LLC (hereafter NextEra Energy Duane Arnold) requested, pursuant to 10 CFR 50.90, a one-time revision to the Technical Specifications (TS) for the Duane Arnold Energy Center (DAEC). Subsequently, the NRC Staff has requested, via electronic mail, additional information regarding that application. Attachment 1 to this letter provides the responses to those requests for information.


As a result of the response to RAI #1, the original TS marked-up and clean, typed pages have been revised and the new pages are found in Attachment 2 and 3, respectively. This is considered an editorial change to the original application and the original evaluation of No Significant Hazards Consideration, per 10 CFR 50.92, submitted with the Referenced application, is not changed.

There are no new commitments or changes to any existing commitment being made in this letter.

If you have any questions or require additional information, please contact Steve Catron at 319-851-7234.

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I declare under penalty of perjury that the foregoing is true and correct.  
Executed on June 27, 2012.

  
Richard L. Anderson  
Vice President, Duane Arnold Energy Center  
NextEra Energy Duane Arnold, LLC

Attachments: 1) Responses to Requests for Additional Information  
2) Revised Marked-up TS Page for TSCR-135  
3) Revised Clean, Typed TS Page for TSCR-135

cc: M. Rasmusson (State of Iowa)

REQUEST FOR ADDITIONAL INFORMATION (RAI)  
REVISION TO ONE-TIME TS CHANGE REGARDING CS OPERABILITY DURING  
SHUTDOWN  
DUANE ARNOLD ENERGY CENTER (DAEC)  
TAC # ME8572

By application dated May 1, 2012, NextEra Energy Duane Arnold LLC, requested changes to the Technical Specifications (TS) for Duane Arnold Energy Center (DAEC). The proposed change would revise the DAEC TS on a one-time basis by adding a footnote to TS Table 3.3.5.1-1, Function 1.d, Modes 4 and 5, specifying that Function 1.d is not required to be met during Refueling Outage 23 in Modes 4 and 5.

The NRC staff has identified the need for additional information to complete its review of the LAR. There are 2 Request for Additional Information Items (RAII) to which have been assigned tracking numbers to facilitate further discussion, if needed:

1. ME8572-RAII-STSB-Bucholz-001-2012-06-29 and
2. ME8572-RAII-SRXB-Razzaque-001-2012-06-29

These tracking numbers identify:

- (1) the sources of RAII by Technical Branches (Technical Specifications (STSB) and Reactor Systems (SRXB) Branches;
- (2) the specific Reviewers, Kristy Bucholtz and Muhammad Razzaque, who requested the information along with a sequential number (in this case 001 for both) for unique identification; and
- (3) a "request by" date nominally set at June 29, 2012 (2012-06-29) subject to confirmation and based on the earlier decision to pursue an aggressive review schedule. Optional use of "Bucholz-001" or "Razzaque-001" in later correspondence or discussions would also uniquely identify items.

Common acronyms used in this RAI include (some acronyms are defined in close proximity to their use):

- CFR = Code of Federal Regulations
- CST = Condensate Storage Tank
- ECCS = Emergency Core Cooling System
- LCO = Limited Condition of Operation
- RFO = Refueling Outage
- STSB = Technical Specifications Branch
- SRXB = Reactor Systems Branch
- SR = Surveillance Requirement
- TS = Technical Specifications

**ME8572-RAII-STSB-Bucholz-001-2012-06-29**

In letter dated May 1, 2012, NextEra Energy Duane Arnold, LLC, (the licensee) proposed changes to the Technical Specifications (TS) for Duane Arnold Energy Center (DAEC). The proposed changes would revise the DAEC TS on a one-time basis by adding a footnote to TS Table 3.3.5.1-1, Function 1.d, Modes 4 and 5, specifying that Function 1.d is not required to be met during Refueling Outage 23 in Modes 4 and 5. DAEC TS Table 3.3.5.1-1 function 1.d currently states:

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
d. Core Spray Pump Discharge Flow – Low (Bypass)	1, 2, 3 4 <sup>(a)</sup> , 5 <sup>(a)</sup>	1 per pump	E	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 256.6 gpm and ≤ 2382.1 gpm

(a) When associated ECCS subsystem(s) are required to be OPERABLE per LCO 3.5.2, ECCS-Shutdown.

Specifically, the proposed changes, as shown below, would add footnote \* to Modes 4 and 5 in DAEC TS Table 3.3.5.1-1 for function 1.d.

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
d. Core Spray Pump Discharge Flow – Low (Bypass)	1, 2, 3 4 <sup>(a)*</sup> , 5 <sup>(a)*</sup>	1 per pump	E	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 256.6 gpm and ≤ 2382.1 gpm

(a) When associated ECCS subsystem(s) are required to be OPERABLE per LCO 3.5.2, ECCS-Shutdown.

\* This requirement is not required to be met during Refueling Outage (RFO) 23.

Basis for the Request

The licensee stated in its application that the proposed TS change would revise the DAEC TS on a one-time basis by adding a note to TS Table 3.3.5.1-1, Function 1d, Modes 4 and 5, specifying that Function 1d is not required to be met during RFO 23 in Modes 4 and 5.

Proposed footnote \*, “This requirement is not required to be met during Refueling Outage (RFO) 23,” is not clear which requirement is referenced.

Request for Additional Information #1

Provide a footnote that states which requirement is affected, how the requirement is affected, when it is applicable, and the duration and/or time frame.

For example, Footnote \*, “The required channels per function for Function 1.d is 0 per pump during Refueling Outage 23 when in Modes 4 and 5.”

Regulatory Analysis Basis

10 CFR 50.90, *Application for amendment of license, construction permit, or early site permit* states:

“Whenever a holder of a license, including a construction permit and operating license under this part, and an early site permit, combined license, and manufacturing license under part 52 of this chapter, desires to amend the license or permit, application for an amendment must be filed with the Commission, as specified in §§ 50.4 or 52.3 of this chapter, as applicable, fully describing the changes desired, and following as far as applicable, the form prescribed for original applications.”

===== **End ME8572-RAII-STSB-Bucholz-001-2012-06-29**=====

NextEra Energy Response:

The footnote has been revised to be clearer as requested. In addition, to improve visibility, the asterisk “\*” used to denote the footnote in the Table has been replaced with the letter “e,” and moved to the “Required Channels per Function” column, which is in keeping with the TS Writers Guide. The new footnote reads:

- (e) During Refuel Outage (RFO) 23, the MODE 4 and 5 requirement for Function 1.d is revised to be zero (0) required channels per pump.

Attachments 2 and 3 to this letter contain the new marked-up TS page and the new clean, typed TS page, respectively.

## ME8572-RAII-SRXB-Razzaque-001-2012-06-29

In the Technical Specification (TS) for DAEC, Surveillance Requirement (SR) 3.5.2.2, (b) states [A box was added for this RAI to contain the entire quote]:

-----NOTE-----  
Only one required CS subsystem may  
take credit for this option during  
OPDRVs. [Operations with the Potential  
for Draining the Reactor Vessel]  
-----  
Condensate storage tank water level in  
one CST is  $\geq 11$  ft or  $\geq 7$  ft in both CSTs.”

The staff understands that the main reason for the above noted TS requirement to allow only one Core Spray (CS) subsystem (out of two required low pressure ECCS subsystems) to take credit for drawing water from condensate storage tank (CST) is a consequence of the limited amount of water in the CST. In order to assure adequate supply of water, the other required ECCS subsystem pump is aligned to the Suppression Pool (SP). SP can be assumed to be an unlimited source of water because in case of a reactor pressure vessel (RPV) draindown, the drained water can be recycled back to RPV via SP (SP is designed to reject the decay heat to the ultimate heat sink). Therefore, the NRC staff believes that if both the CS pumps are to be aligned to CST (when SP is unavailable) with fuels still in the RPV, then a RPV draindown cannot be mitigated that lasts long enough to provide time to use all of available CST water. Consequently, fuels in the RPV can become uncovered during such a postulated draindown scenario. In light of the above discussion, please provide the following additional information:

Justify how DAEC can prevent and mitigate such a draindown event during OPDRV, as postulated above, using two CS subsystems both of which are aligned to CST which has only limited amount of water and has no ultimate heat sink available. The justification should include reasonable assurance that DAEC is equipped to mitigate such a draindown event for the period when SP will be out of service for re-coating. Otherwise, the NRC staff believes that LCO 3.5.2 should be applicable in MODE 4 and MODE 5, except when the cavity level is  $\geq 21$  ft, 1 inch above the RPV flange, with the Spent Fuel Pool gates removed, as stated in the DAEC TS.

===== **End ME8572-RAII-SRXB-Razzaque-001-2012-06-29**=====

NextEra Energy Response:

As noted by the Staff, the subject Note to SR 3.5.2.2 only allows one CS subsystem to be aligned to the CST during OPDRVs. NextEra Energy Duane Arnold considered this Note during the development of our application, but determined that the DAEC could continue to comply with the existing TS requirements of LCO 3.5.2 and consequently, NextEra Energy Duane Arnold did not request relief from this SR Note in our application. The requested TS change only affects the minimum flowpath (logic and valves) for the CS system. There are no requested changes in how the CSTs can be credited as a suction source for complying with LCO 3.5.2.

NextEra Energy Duane Arnold has reviewed the Actions contained in NRC Enforcement Guidance Memorandum (EGM) 11-003 regarding OPDRVs when Secondary Containment is not Operable in MODE 5 (ADAMS Accession Number ML11251A230). Accordingly, NextEra Energy Duane Arnold has scheduled all OPDRV activities in RFO23 to take place when either:

1. a. The Reactor Pressure Vessel (RPV) cavity is fully flooded up<sup>1</sup>, i.e., when LCO 3.5.2 is no longer required to be met and the SR 3.5.2.2 Note is no longer applicable,

AND

- b. Secondary Containment is Operable.

OR

2. If the cavity is not flooded up (i.e., the LCO 3.5.2 Applicability is met and the Note to SR 3.5.2.2 applies):
  - a. the minimum water level in the Suppression Pool is adequate, per SR 3.5.2.2, to support Residual Heat Removal (RHR) pump(s) for meeting LCO 3.5.2 (i.e., the Torus is not completely drained),

AND

- b. Secondary Containment is Operable.

To summarize, no credit will be taken during RFO23 for both CS pumps, with their suction piping aligned to the CST, for complying with LCO 3.5.2 during OPDRVs.

It should be noted that the draining of the Suppression Pool in MODES 4 and 5 does not result in a loss of decay heat removal to the ultimate heat sink, as the RHR System will be Operable for Shutdown Cooling mode, per TS LCOs, 3.4.8, 3.9.7, and 3.9.8.

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<sup>1</sup> RPV level greater than or equal to 21 feet, 1 inch above the RPV flange and the Spent Fuel Pool gates removed.

NextEra Energy Duane Arnold will prevent challenges that could potentially become inadvertent draindown events by controlling the work activities, in accordance with the outage schedule. By controlling the outage activities during RFO23, in particular, those associated with OPDRVs, to when the RPV cavity is flooded or when the RHR pumps are available for complying with LCO 3.5.2, with the minimum required water level in the Torus, NextEra Energy Duane Arnold will assure that sufficient capability exists to mitigate potential draindown events, without over reliance on the CS subsystems being aligned to the CSTs.

In the event an unexpected draindown event does occur when the Torus is drained, there is a large inventory of makeup water available for mitigation. Because DAEC is a “zero release” plant for liquid radioactive effluents, none of the primary Reactor system water inventory is discarded; in particular, the approximately 400,000 gals of water removed from the Torus during the re-coat project. A total of approximately 1.1 Million gallons of water is stored in a combination of locations, at various times, during the RFO, such as the CSTs, RPV cavity, main condenser, Torus, and Radioactive Waste building. Thus, DAEC is not totally reliant on just the fixed amount of inventory in the CSTs for make-up capability during RFO23.



Revised  
Marked-up TS Page  
For TSCR-135

Table 3.3.5.1-1 (page 1 of 5)  
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
<b>1. Core Spray System</b>					
a. Reactor Vessel Water Level – Low Low Low	1,2,3, 4 <sup>(a)</sup> , 5 <sup>(a)</sup>	4 <sup>(b)</sup>	B	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 38.3 inches
b. Drywell Pressure - High	1,2,3	4 <sup>(b)</sup>	B	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 2.19 psig
c. Reactor Steam Dome Pressure – Low (Injection Permissive)	1,2,3	4	C	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 363.3 psig and ≤ 485.1 psig
	4 <sup>(a)</sup> , 5 <sup>(a)</sup>	4	<b>(e)</b>	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 363.3 psig and ≤ 485.1 psig
d. Core Spray Pump Discharge Flow – Low (Bypass)	1,2,3, 4 <sup>(a)</sup> , 5 <sup>(a)</sup>	1 per pump	E	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 256.6 gpm and ≤ 2382.1 gpm
e. Core Spray Pump Start Time Delay Relay	1,2,3, 4 <sup>(a)</sup> , 5 <sup>(a)</sup>	1 per pump	C	SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 2.6 seconds and ≤ 6.8 seconds
f. 4.16 kV Emergency Bus Sequential Loading Relay	1,2,3, 4 <sup>(a)</sup> , 5 <sup>(a)</sup>	1 per pump	F	SR 3.3.5.1.5 SR 3.3.5.1.6 SR 3.3.5.1.9	≤ 3500 V
<b>2. Low Pressure Coolant Injection (LPCI) System</b>					
a. Reactor Vessel Water Level- Low Low Low	1,2,3, 4 <sup>(a)</sup> , 5 <sup>(a)</sup>	4	B	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 38.3 inches
b. Drywell Pressure - High	1,2,3	4	B	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 2.19 psig

(continued)

(a) When associated ECCS subsystem(s) are required to be OPERABLE per LCO 3.5.2, ECCS-Shutdown.

(b) Also required to initiate the associated Diesel Generator (DG).

(e) During Refuel Outage (RFO) 23, the MODE 4 and 5 requirement for Function 1.d is revised to be zero (0) required channels per pump.

Revised  
Clean, Typed TS Page  
For TSCR-135

Table 3.3.5.1-1 (page 1 of 5)  
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Vessel Water Level – Low Low Low	1,2,3, 4 <sup>(a)</sup> , 5 <sup>(a)</sup>	4 <sup>(b)</sup>	B	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 38.3 inches
b. Drywell Pressure - High	1,2,3	4 <sup>(b)</sup>	B	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 2.19 psig
c. Reactor Steam Dome Pressure – Low (Injection Permissive)	1,2,3	4	C	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 363.3 psig and ≤ 485.1 psig
	4 <sup>(a)</sup> , 5 <sup>(a)</sup>	4	B	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 363.3 psig and ≤ 485.1 psig
d. Core Spray Pump Discharge Flow – Low (Bypass)	1,2,3, 4 <sup>(a)</sup> , 5 <sup>(a)</sup>	1 per pump <sup>(e)</sup>	E	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 256.6 gpm and ≤ 2382.1 gpm
e. Core Spray Pump Start Time Delay Relay	1,2,3, 4 <sup>(a)</sup> , 5 <sup>(a)</sup>	1 per pump	C	SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 2.6 seconds and ≤ 6.8 seconds
f. 4.16 kV Emergency Bus Sequential Loading Relay	1,2,3, 4 <sup>(a)</sup> , 5 <sup>(a)</sup>	1 per pump	F	SR 3.3.5.1.5 SR 3.3.5.1.6 SR 3.3.5.1.9	≤ 3500 V
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Vessel Water Level- Low Low Low	1,2,3, 4 <sup>(a)</sup> , 5 <sup>(a)</sup>	4	B	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 38.3 inches
b. Drywell Pressure - High	1,2,3	4	B	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 2.19 psig

(continued)

(a) When associated ECCS subsystem(s) are required to be OPERABLE per LCO 3.5.2, ECCS-Shutdown.

(b) Also required to initiate the associated Diesel Generator (DG).

(e) During Refuel Outage (RFO) 23, the MODE 4 and 5 requirement for Function 1.d is revised to be zero (0) required channels per pump.