

## **PMNorthAnna3COLPEmails Resource**

---

**From:** Patel, Chandu  
**Sent:** Friday, May 13, 2011 2:28 PM  
**To:** 'na3raidommailbox@dom.com'  
**Cc:** Weisman, Robert; NorthAnna3COL Resource; Nold, David; Kallan, Paul  
**Subject:** Draft RAI 5658, Section 9.4.5, North Anna 3 COLA  
**Attachments:** Draft RAI 5658 (2).doc

Please see attached Draft RAI 5658 for Section 9.4.5 of North Anna 3 COLA. Please let me know if you need any clarification by COB May 18, 2011. Otherwise, it will be issued as final after May 18, 2011.

Sincerely,  
Chandu Patel  
Lead Project Manager for North Anna 3 COLA  
DNRL, NRO

**Hearing Identifier:** NorthAnna3\_Public\_EX  
**Email Number:** 955

**Mail Envelope Properties** (8C658E9029C91D4D90C6960EF59FC0D61E22845EC7)

**Subject:** Draft RAI 5658, Section 9.4.5, North Anna 3 COLA  
**Sent Date:** 5/13/2011 2:27:59 PM  
**Received Date:** 5/13/2011 2:28:01 PM  
**From:** Patel, Chandu

**Created By:** Chandu.Patel@nrc.gov

**Recipients:**

"Weisman, Robert" <Robert.Weisman@nrc.gov>  
Tracking Status: None  
"NorthAnna3COL Resource" <NorthAnna3COL.Resource@nrc.gov>  
Tracking Status: None  
"Nold, David" <David.Nold@nrc.gov>  
Tracking Status: None  
"Kallan, Paul" <Paul.Kallan@nrc.gov>  
Tracking Status: None  
"na3raidommailbox@dom.com" <na3raidommailbox@dom.com>  
Tracking Status: None

**Post Office:** HQCLSTR02.nrc.gov

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	316	5/13/2011 2:28:01 PM
Draft RAI 5658 (2).doc	46074	

**Options**

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

Request for Additional Information No. 5658 (Draft)  
North Anna, Unit 3  
Dominion  
Docket No. 52-017  
SRP Section: 09.04.05 - Engineered Safety Feature Ventilation System  
Application Section: 9.4.5

QUESTIONS for Containment and Ventilation Branch 1 (AP1000/EPR Projects) (SPCV)

09.04.05-\*\*\*

The staff notes that the applicant chose to designate FSAR sections 9.4.5.2.3 and 9.4.5.2.5 as NAPS COL 9.4(4) while the other FSAR sections referencing "The capacity of the heating coils..." are designated as STD COL 9.4(4). When compared, the actual sizes of heating coils to be used at North Anna Unit 3 as captured Table 9.4-201 "Equipment Design Data" are consistently larger in capacity than the RCOLA applicant's heating coils. Only the heating coil capacities as listed on Table 9.4-201 is unique to North Anna 3 from the RCOLA. The staff requests additional information as to the reasoning behind labeling FSAR sections 9.4.5.2.3 and 9.4.5.2.5 as NAPS COL 9.4(4)?

09.04.05-\*\*\*

Dominion indicated in its letter (ML103160406) to the staff of November 10, 2010 (Serial No. NA3-10-019), that the SCOL applicant did not endorse the RCOL applicant's response to RAI #3219, (CP RAI # 63) Question #09.04.01-1. There was no note provided in the letter's "Endorsement Clarification" column that would explain the SCOL applicant's reasons for non endorsement. The staff requests that the SCOL applicant provide resolutions to the following issues documented in Question #09.04.01-1.

In combined license application SCOL FSAR subsection 9.4.1.2 and FSAR Table 9.4-201, Luminant assigns a heating coil capacity value of 45 kW to the heaters of the four Main Control Room (MCR) Air Handling Units (AHU).

During its review, using the guidance of NUREG-800 Standard Review Plan (SRP) 9.4.1, the NRC staff found that the SCOL applicant did not include a reference in COLA FSAR Section 9.4.8 that would provide the basis and calculations used in the sizing of the heaters (i.e. 4 KW) for the MCR AHU. The staff acknowledges that DCD ITAAC Item 4.a of Tier 1 Table 2.7.5.1-3 establishes clear performance criteria for the heaters and a means of verifying that heaters have been sized adequately.

- What is the plant specific design basis for the sizing of the heaters?
- What is the design basis MCR temperature that the heaters are designed to maintain?

These design bases should be clearly stated in the SCOL FSAR.

09.04.05-\*\*\*

Dominion indicated in its letter (ML103160406) to the staff of November 10, 2010 (Serial No. NA3-10-019), that the SCOL applicant did not endorse the RCOL applicant's response to RAI #3230, (CP RAI # 110) Question #09.04.05-1. There was no note provided in the letter's "Endorsement Clarification" column that

would explain the SCOL applicant's reasons for non endorsement. The staff requests that the SCOL applicant provide resolutions to the following issues documented in Question #09.04.05-1.

In combined license application SCOL FSAR subsections 9.4.5.2.2, 9.4.5.2.3, 9.4.5.2.4, 9.4.5.2.5 and FSAR Table 9.4-201, the RCOL applicant assigns a heating coil capacity values to the heaters of the air handling units for the following systems:

- Class 1E Electrical Room HVAC System;
- Safeguard Component Area HVAC System;
- Emergency Feedwater Pump Area HVAC System; and
- Safety Related Component Area HVAC System

Class 1E power supplies provides the staff assurance of the ability of the engineered safety features (ESF) air handling unit heaters to provide this safety function during and subsequent to postulated accidents, including loss of offsite power.

The staff acknowledges that DCD ITAAC Items 4.b, 4.d, 4.c and 4.f of Tier 1 Table 2.7.5.2-3 establishes clear performance criteria for the heaters and a means of verifying that heaters have been sized adequately.

During its review, per the guidance of NUREG-800 Standard Review Plan (SRP) 9.4.5, the NRC staff found that the SCOL applicant did not include in the FSAR a reference section (9.4.8 in the DCD) or references that would provide the bases and calculations used in the sizing of the heaters for these ESF systems' air handling units.

- What is the plant specific design basis (i.e. external ambient conditions) for the sizing of the heaters?
- What is the design basis temperature that the heaters are designed to maintain within their respective rooms?

These design bases should be clearly stated in the SCOL FSAR.

09.04.05-\*\*\*

Dominion indicated in its letter (ML103160406) to the staff of November 10, 2010 (Serial No. NA3-10-019), that the SCOL applicant does not endorse the RCOL applicant's response to RAI #3232, (CP RAI # 123) Question #09.04.05-5. The staff views the RCOL applicant's response to Question #09.04.05-5 as incomplete and considers this to be an Open Item in the RCOLA. Subsequently, the staff in March, 2011 issued a follow-up NRC RAI ID No. 5585, Q#20497, Question #09.04.05-17 to the RCOL applicant to resolve the outstanding design issues.

Given that the SCOL applicant did not endorse the RCOL applicant's resolution to Question #09.04.05-5, the staff submits the near original RCOL Question to the SCOL applicant for additional information about their intended resolution of the following questions.

#### Internal Flooding – GDC 4

Section II of SRP section 9.4.5 provides the "Technical Rationale" behind the acceptance criteria for GDC 4. An excerpt from this passage reads: "Compliance with GDC 4 requires that structures, systems, and components important to safety be designed to accommodate the effects of, and be compatible with, environmental conditions associated with normal operation, maintenance,

testing, and postulated accidents, including loss-of-coolant accidents. These structures, systems, and components shall be protected against dynamic effects (e.g., those of missiles, pipe whipping, and discharging fluids) that may result from equipment failure and from events and conditions outside the nuclear power unit.”

Two of the “Review Interfaces” from SRP section 9.4.5 that these “dynamic effects” refer to are captured in SRP section 3.4.1 “Internal Flood Protection For Onsite Equipment Failures” and SRP section 3.6.1 “Plant Design For Protection Against Postulated Piping Failures In Fluid Systems Outside Containment”.

The NRC staff notes that US-APWR DCD subsection 3.4.1.1 contains the following excerpt:

“Safety-related SSCs are protected from flooding by external and internal sources. The US-APWR design includes the following:

- The separation of redundant trains of safety-related SSCs as addressed in Chapters 1
- Protective barriers and enclosures, where necessary, as addressed in this section
- The placement of essential SSCs above internal flood levels
- SSCs are mounted above the flood level. While safety-related SSCs that are environmentally protected in accordance with Section 3.11 are permitted below the potential flood level, no components requiring active operation to achieve their intended safety function are located below the potential flood level.

The safety-related design basis contained in the second bullet of the North Anna 3 FSAR subsection 9.4.5.3.6 reads: “*The ESW pump room exhaust fan and the UHS transfer pump room exhaust fan are separated by a three-hour fire rated barrier. Therefore, each fan powered by different Class 1E power supplies is protected and remains functional in the event of a fire in either room.*”

The NRC staff requests additional information about the barrier between the ESW pump room and the UHS transfer pump room. RCOL FSAR Appendix 9A “Fire Hazard Analysis” indicates that there may be 3-hour fire rated passages between the two rooms. With respect to the issue of internal flooding, the staff could find no information contained in the RCOL applicant’s FSAR subsection 3.4. Please clarify, is there a flood barrier between the UHS ESW pump and the UHS Transfer Pump? Please update the FSAR as appropriate.

09.04.05-\*\*\*

Dominion indicated in its letter (ML103160406) to the staff of November 10, 2010 (Serial No. NA3-10-019), that the SCOL applicant does not endorse the RCOL applicant’s response to RAI #3232, (CP RAI # 123) Question #09.04.05-9.

Given that the SCOL applicant did not endorse the RCOL applicant’s resolution to Question #09.04.05-9, the staff submits the near original Question to the SCOL applicant for their own resolution to the following request for additional information.

Proper Functioning of the Essential Electric Power System – GDC 17

The second paragraph from Section II “Acceptance Criteria” of SRP section 9.4.5 “Technical Rationale” item 4 reads:

“With regard to the ESFVS, the plant design should ensure that electrical contacts and relays in diesel generator rooms are protected from dust, dirt, and grit. For example, contacts and relays must be enclosed in dust-tight cabinets with fully gasketed openings and ventilation louvers must be equipped with filters. In addition, air used for ventilation should be filtered and should be taken from a height of at least 7 meters (20 feet) above ground level.”

The NRC staff notes that NUREG-CR/0660 “Enhancement of Onsite Emergency Diesel Generator Reliability” addresses this issue.

The staff could find no information in the RCOL FSAR about the spatial positioning of the fresh air intake dampers. More specifically, to limit the flow of airborne particulate (dust) into the two rooms of the UHS ESW Pump House, the bottom of the fresh air intakes are to be positioned 20 feet above grade elevation. Alternately, or in addition to, the electrical and instrumentation cabinets are to be provided with suitable seals or gaskets to prevent dust from entering the cabinets.

The NRC staff requests additional information about how the design of the UHS ESW Pump House satisfies these GDC 17 required design attributes.

#### 09.04.05-\*\*\*

Dominion indicated in its letter (ML103160406) to the staff of November 10, 2010 (Serial No. NA3-10-019), that the SCOL applicant endorsed the RCOL applicant’s response to RAI #3232, (CP RAI # 123) Question #09.04.05-10. The staff views the RCOL applicant’s response to Question #09.04.05-10 as incomplete and considers this to be an Open Item in the RCOLA. Subsequently, the staff in March, 2011 issued a follow-up NRC RAI ID No. 5585, Q#20517, Question #09.04.05-18 to the RCOL applicant to resolve the outstanding design issues.

The staff submits to the SCOL applicant for their own resolution the following residual issues (i.e. Open Item) with the RCOL application. Alternatively, the SCOL applicant can wait for the RCOL applicant to resolve these issues and notify the staff that they endorse that resolution.

(1) The staff disagrees with the statement contained in 2b of the applicant’s response “... do not perform an active safety function”. During the summer months these dampers must change state from the normally closed position to the open position whenever the exhaust fans are running. This change of state function, allows the ESW Pump House rooms to remain below the design basis limiting temperature of 120°F in support of running the safety related UHS ESW pumps. Conversely during the winter months, these dampers must fail to the closed position to ensure that the ESW Pump House rooms remain above the design basis lower limiting temperature of 40°F. This change of state function, helps to ensure that the safety related UHS ESW pumps remain operable while in standby during normal plant operations. The staff requests that the applicant re-evaluate this sentence and amend the FSAR as necessary and in particular ITAAC Table A.2-2 and FSAR 9.4.5.2.6, with greater clarity.

(2) The staff notes that Part 10 ITAAC Table A.2-2 lists the safety related temperature switches (e.g. VRS-TS-2610C,D,E,F) for the “ESW Pump Room Temperature” and “UHS ESW pump Room Temperature” but not their in series

Temperature Controllers (e.g. VRS-TC-2610C,D,E,F). The staff requests additional information about this series safety related/non-safety arrangement and the Class 1E and non Class 1E control circuits.

(3) The staff notes that the safety related temperature switches (e.g. VRS-TS-2610C,D,E,F) do not appear in FMEA Table 9.4-203. The staff requests that these safety related components be added to the Table 9.4-203.

#### 09.04.05-\*\*\*

Dominion indicated in its letter (ML103160406) to the staff of November 10, 2010 (Serial No. NA3-10-019), that the SCOL applicant did not endorse the RCOL applicant's response to RAI #3232, (CP RAI # 123) Question #09.04.05-7. There was no note provided in the letter's "Endorsement Clarification" column that would explain the SCOL applicant's reasons for non endorsement. The staff notes that the RCOL applicant's response to Question #09.04.05-7 results in significant changes to the RCOL FSAR (i.e. pgs 9.4-2 and 9.4-5).

The staff requests that the SCOL applicant provide resolutions to the issues documented in Question #09.04.05-7.