

## PMNorthAnna3COLPEmails Resource

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**From:** Kallan, Paul  
**Sent:** Monday, July 02, 2012 9:53 AM  
**To:** NorthAnna3COL Resource  
**Subject:** FW: NA3 audit\_ESW\_UHS.docx  
**Attachments:** NA3 audit\_ESW\_UHS.docx

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**From:** Kallan, Paul  
**Sent:** Tuesday, May 15, 2012 9:46 AM  
**To:** 'Barry.bryant@dom.com'  
**Subject:** FW: NA3 audit\_ESW\_UHS.docx

Hi Barry,

Here is the Draft audit plan so you can plan accordingly. There are three sections 9.2.1, 9.2.2 and 9.2.5 that we would like to audit.

Regards,

Paul

**Hearing Identifier:** NorthAnna3\_Public\_EX  
**Email Number:** 1094

**Mail Envelope Properties** (94A2A4408AC65F42AC084527534CF4169DA708AD07)

**Subject:** FW: NA3 audit\_ESW\_UHS.docx  
**Sent Date:** 7/2/2012 9:52:54 AM  
**Received Date:** 7/2/2012 9:52:57 AM  
**From:** Kallan, Paul

**Created By:** Paul.Kallan@nrc.gov

**Recipients:**  
"NorthAnna3COL Resource" <NorthAnna3COL.Resource@nrc.gov>  
Tracking Status: None

**Post Office:** HQCLSTR01.nrc.gov

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MESSAGE	330	7/2/2012 9:52:57 AM
NA3 audit_ESW_UHS.docx	48527	

**Options**  
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**Return Notification:** No  
**Reply Requested:** Yes  
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**Expiration Date:**  
**Recipients Received:**

June xxx 2012

MEMORANDUM TO: Hossein Hamzehee, Branch Chief  
US-APWR Projects Branch  
Division of New Reactor Licensing  
Office of New Reactors

FROM: Eileen McKenna, Branch Chief  
Balance of Plant and Technical Specifications Branch  
Division of Safety Systems and Risk Assessment  
Office of New Reactors

SUBJECT: AUDIT PLAN TO REVIEW NORTH ANNA UNIT 3 (US-APWR),  
REVISION 5 ISSUES FOR CHAPTER 9 (INCLUDING CALCULATIONS)

Attached is the audit plan to review selected balance of plant (BOP) areas related to North Anna Unit 3 (US-APWR) (Docket No. 52-017) Combined License (COL) and Final Safety Analysis Report (FSAR), Revision 5, Chapter 9, submitted to the U.S. Nuclear Regulatory Commission (NRC) application in March 16, 2012. After conducting a comprehensive review of the COL, Revisions 0 through 5, the staff concluded that additional information is needed from the applicant to support the staff's safety evaluation. The purpose of this audit is to review additional Virginia Electric and Power Company (Dominion) documents that contain information not currently in the COL that are related to the essential service water (Section 9.2.1), component cooling water (Section 9.2.2) and ultimate heat sink (9.2.5).

Enclosure: As Stated

CONTACT: Larry Wheeler, DSRA/BPTS  
(301) 415-1278

**Comment [L1]:** PM – check applicant date please

**AUDIT PLAN  
TO REVIEW SELECTED AREAS RELATED TO  
NORTH ANNA UNIT 3  
CHAPTER 9 and CALCULATIONS**

APPLICANT: Virginia Electric and Power Co (Dominion)

APPLICANT CONTACT:

TIME: 2012

LOCATION: 5000 Dominion Blvd  
Innsbrook Campus  
Glen Allen, Virginia ????

TECHNICAL REVIEWERS: Larry Wheeler (NRO, Audit Team Leader)  
Chang Li (NRO – reviewer) ??

PROJECT MANAGERS Jeff Ciocco  
Paul Kallan

## **A. Background**

The staff will be conducting an audit of the North Anna Unit 3 COL, Revision 5, Chapter 9 focusing on balance of plant sections. The systems to be included within the scope of this audit include the essential service water (Section 9.2.1), component cooling (Section 9.2.2) and ultimate heat sink (Section 9.2.5).

The purpose of this audit is to review additional documents, including calculations, provided by Dominion which pertain to the COL and applicable Standard Review Plan (SRP) sections as requested in requests for additional information (RAIs) outlined in Table 2. The staff will focus on reviewing the calculation methodologies, assumptions, and results used to reach conclusions for these RAIs. This will enable the staff to gain a better understanding of the detailed calculations, analyses and/or bases underlying the formal application and confirm the staff's understanding of the application.

To achieve the review goals in an efficient manner, the staff assembled an interdisciplinary audit team consisting of professionals with expertise in all the various systems to be reviewed. The audit team will include staff from the NRC. To facilitate and expedite the work, it is foreseen that the audit will be attended by representatives from Dominion who will also introduce the documents available for the staff to review and indicate documents which are classified as proprietary along with the supporting documents and technical evidence to the reviewers. The staff will document the audit findings in an audit report that may result in new supplemental RAIs.

## **B. Regulatory Audit Bases**

The bases for the audit include all documents in Table 2 below, North Anna Unit 3 COL (Revision 5), and all supporting calculations used to ensure compliance with the General Design Criteria (GDC) outlined in the applicable SRP.

## **C. Regulatory Audit Scope or Methodology**

The areas of focus for the audit are the calculation methodologies, assumptions, and results used to reach conclusions for various previously submitted RAIs. The subjects of these RAIs are listed in Table 2.

## **D. Information and Other Material Necessary for the Regulatory Audit**

Copies of the COL, Revision 5 should be available as reference materials to the audit members. All calculations, as defined in Table 2, used to develop responses for RAIs should be provided along with knowledgeable personnel to explain any questions the staff may have about the calculations. Finally, previous Dominion RAI responses to related systems should be available as well as other related design documents as requested.

## **E. Team Assignments**

The team leader will be responsible for conducting the audit. Other team member/contractors will assist as required.

## **F. Logistics**

The NRC staff will conduct the review over a period of two business days. Any remaining items not discussed at the end of the 2<sup>nd</sup> day will be deferred for future NRC/Dominion audits.

Following the audit, each technical reviewer will prepare a separate audit report with specific findings and proposed supplemental RAIs and will send the report to the team leader two weeks from the audit date. The team leader will assemble and prepare a final audit report. This final audit report will contain a section that lists all supplemental RAIs. The final report will be made available to all contributors for their concurrence before issuance.

An agenda for the audit is presented in Table 1 and the specific audit areas supporting technical documentation are identified in Table 2.

If necessary, any circumstances related to the conductance of the audit will be communicated to Paul Kallan (NRC Project Manager) at 301-415-2809 (paul.kallan@nrc.gov).

## **G. Special Requests**

None

## **H. Deliverables**

At the conclusion of the audit, the staff will generate an audit report which will summarize the questions and Dominion's response and will note any flowing-up actions such as supplement RAI responses. This report will be made available to the NRC project manager within 30 days of the completion of this audit.

## **I. References**

NRC/NRO Office Instruction, NRO-REG-108, Revision 0, Regulatory Audits (ML081910260)

**Table 1: Audit Agenda**

Date	Time	Item	Responsible
	9:00am – 9:30pm	Opening remarks, presentation of participants, organizational questions	NRC and DSRA BPTS Branch Chief
	9:30pm – 12:00pm	Audit of calculations	Dominion
	12:00pm – 1:00pm	Lunch Break	
	1:00pm – 4:00pm	Audit of calculations	Dominion
	9:00am – 12:00pm	Audit of calculations	Dominion
	12:00pm – 1:00pm	Lunch Break	
	1:00pm – 3:30pm	Audit of calculations	Dominion
	3:30pm – 4:00pm	Audit Summary (Exit)	NRC Staff

**Table 2: Audit Items**

<b>System</b>	<b>Calculations ##</b>
Essential Service Water (9.2.1)	<ul style="list-style-type: none"><li>• ESW pump NPSH</li><li>• ESW pump vortex</li><li>• ESW pump head</li><li>• ESW flow velocities</li><li>• ESW uncontrolled blowdown</li><li>• ESW Water hammer analysis</li><li>• Fire protection supply from ESW</li></ul> <p>Note: ESW-AOV-577 which has 4 power supplies is still an open item between MHI and the COLs. NRC may wish to discussion this and engage MHI during the audit, as time permits.</p>
Component Cooling Water (9.2.2)	<ul style="list-style-type: none"><li>• Associated calculation related to the removal of the boric acid evaporator which is replaced with the degasifier (COL Departure)</li><li>• CCW surge tank heat-up and expansion; see MHI Calculation 4BS-UAP-100196, Tanks Size Calculation (R/2, 4/13/12)</li></ul>
Ultimate Heat Sink (9.2.5)	<ul style="list-style-type: none"><li>• Cooling Tower Basin Volume and water levels, accounting for sedimentation – 30 day requirement</li><li>• Cooling Tower calculations including wet-bulb determination, evaporation and drift rates</li><li>• Heat transfer (cooling capacity and cooling rates in accordance with 350F to 200F within 36 hours)</li><li>• UHS Transfer pumps, NPSH, vortex, head, flow velocities</li></ul>

**## Minimum calculations to be reviewed by the staff**