PMNorthAnna3COLPEmails Resource

From: Jerry Hale
Sent: Tuesday, February 24, 2009 11:11 AM
To: NorthAnna3COL Resource
Subject: FW: Staff-Dominion telecon re NA SER Section 2.4 RAIs - 2/09/2009 Telcon Summary

NA SER 2.4
eleconItems 020909

From: NorthAnna3COL Resource
Sent: Tuesday, February 24, 2009 11:01 AM
To: Jerry Hale
Subject: FW: Staff-Dominion telecon re NA SER Section 2.4 RAIs - 2/09/2009 Telcon Summary

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From: Andrea Johnson
Sent: Tuesday, February 17, 2009 3:20 PM
To: NorthAnna3COL Resource
Cc: Richard Raione; Regina.Borsh@dom.com; Thomas Kevern; Christopher Cook; Mark McBride
Subject: RE: Staff-Dominion telecon re NA SER Section 2.4 RAIs - 2/09/2009 Telcon Summary

MEMORANDUM TO: File (Docket No. 52-017, North Anna Unit 3 COL Application)

FROM: Andrea M. Johnson, Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

SUBJECT: Summary of Telephone Call with Applicant February 9, 2009 Regarding FSAR Section 2.4 (Hydrology) Review

On February 9, 2009, NRC staff and its contractor participated in a telephone conference call with Dominion representatives (G. Borsh, et al) regarding the staff's detailed review of the North Anna Unit 3 COL application. The purpose of the call was to discuss topics ("talking points") as transmitted in the attached file to applicant via email on January 29, 2009.

The discussion focused on North Anna COLA Rev. 1, and the staff's review in accordance with SRP section 2.4. As a result of the call, below are staff's disposition of each "talking point":

- **Talking Point 1:**
  - **One RAI to cover sub-points (a), (b), (c), and (e)**
  - **One RAI to cover sub-point (d)**
- **Talking Point 2:**
  - **Closed.**
- **Talking Point 3:**
  - **One RAI**
- **Talking Point 4:**
  - **One RAI to cover sub-points (a), (b), (c)**
  - **Sub-point (e) is closed.**

It may be appropriate to schedule an audit in the near future to facilitate staff review of applicant responses and supporting documentation.

NOTE: Word document orginally imbedded here has been attached to the email to allow for processing to ADAMS.

-----Original Appointment-----
From: Thomas Kevern
Sent: Thursday, January 29, 2009 11:27 AM
To: Thomas Kevern; Regina.Borsh@dom.com; Christopher Cook; Mark McBride; Andrea Johnson
Cc: Richard Raione
Subject: Staff-Dominion telecon re NA SER Section 2.4 RAIs
When: Monday, February 09, 2009 11:00 AM-12:00 PM (GMT-05:00) Eastern Time (US & Canada).
Where: T-7B1

When: Monday, February 09, 2009 11:00 AM-12:00 PM (GMT-05:00) Eastern Time (US & Canada).
Where: T-7B1

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Telecon - at staff request - to discuss Dominion responses to several RAIs related to NA SER Section 2.4.
The attached file provides background information and summarizes the staff discussion points.

<< File: NA SER 2.4 TeleconItems 020909.doc >>

Hearing Identifier: NorthAnna3_Public_EX
Email Number: 636

Mail Envelope Properties (D841D501B2C4D244B75AB897F70C1494862C26C884)

Subject: FW: Staff-Dominion telecon re NA SER Section 2.4 RAIs - 2/09/2009 Telcon Summary
Sent Date: 2/24/2009 11:10:45 AM
Received Date: 2/24/2009 11:10:46 AM
From: Jerry Hale

Created By: Jerry.Hale@nrc.gov

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

Post Office: HQCLSTR01.nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	2735	2/24/2009 11:10:46 AM
NA SER 2.4 TeleconItems 020909.doc	42490	

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

North Anna 3 COL
Hydrology (Section 2.4) Review
Talking Points for February 2009 Call

Talking Point 1: FSAR Section 2.4.2

On September 16, 2008, the applicant responded to RAI 2.4.2-1 in Letter No. 028 (ML082680033). The applicant stated that the analysis incorporated conservative assumptions, so that the resulting water levels are conservatively high. The conservative assumptions include a high runoff coefficient, 25% reduction in time of concentration values, conservative estimation of flow into the north ditch because some flow will likely overflow the access road and bypass the SWM basin, all culverts were assumed blocked, and the estimated discharge for each sub-basin was applied to the upstream end of the sub-basin.

Specifically concerning RAI 2.4.2-1(a), the applicant stated that they will reevaluate any changes to final site grade and the effect on the local PMP analyses based on 10 CFR 50.59 requirements.

Specifically concerning RAI 2.4.2-1(b), the applicant stated that a storm water pollution prevention plan (SWPPP) and an Erosion & Sediment Control Plan will be prepared that includes provisions to prevent placement of obstructions and blockages in the drainage channels.

Specifically concerning RAI 2.4.2-1(c), the applicant provided a description of runoff from impervious areas. The applicant also stated that there are no parking areas within the power block area for Unit 3. Runoff from the administration building parking lot discharges to the storm water basin located at the southeast corner of the lot. This basin then discharges to the WHTF.

However, the staff has additional questions. In order to assure that the locally-intense precipitation flood event will not adversely impact Unit 3's safety-related SSCs, or those that satisfy the RTNSS criteria, and that construction of Unit 3 will demonstrate compliance with 10 CFR 52.79(a)(31), staff would like to discuss the following:

a) Locations where supercritical flows are likely to occur in the south ditch, north ditch, outfall channel, and associated overland-flow areas. Also indicate locations where PMP-generated flood events produce velocities significantly larger than the design velocity for the channel bed material (i.e., where damage exceeding normal maintenance would result). For these locations, describe how failure of these drainage features will not degrade any structures related to safety.
b) Locations where hydraulic jumps are likely to form during the flooding event and provide a description of fortification measures to ensure that hydraulic forces induced by the jumps do not erode or degrade the south ditch, north ditch, and outfall channel, and associated overland areas. If the hydraulic structures are expected to fail during the PMP-generated flood event, provide a description describing how failure will not degrade any structures related to safety.
c) Description of the lateral-structure flow simulated in the numerical model. Include details regarding the expected flow path, depth and velocity of flow, erosion control measures, and a list of buildings and structures (including their RTNSS categorization, if appropriate) that are intercepted along the flow path.
d) Description of fortification measures for the access road between the south ditch and Unit 2. Since water velocities in the south ditch immediately upstream of the abrupt bend are in excess of 10 ft/s, describe fortification measures to ensure all discharge in

the south ditch will complete the 90-degree abrupt bend during the flood event. This description should include how two-dimensional effects and super-elevation of flow in the ditch were factored into the design. In addition, describe fortification measures to prevent piping failures and possible breach of the access road when the SWM basin is at the PMP-generated maximum elevation of 271.7 ft.

e) Description of Administrative Controls or surveillance requirements to ensure the north ditch, south ditch, and outfall canal remain clear of obstructions, the side-slopes remain stable, and that the site-drainage system will function as described in the FSAR considering the length of the Unit 3 licensing period.

Talking Point 2: FSAR Section 2.4.12

NAPS Water Supply Well Information

Corrected and supplemental information is provided on the location and pumping rates for existing groundwater supply wells onsite in FSAR Tables 2.4-17R and 2.4-205. The applicant states that any groundwater use for Unit 3 will not be safety-related.

In the COLA Departures Report, the applicant identifies a variance in the plant water supply well information (NAPS ESP Var 2.4-2) arising from the use of incorrect information in the SSAR and new information obtained on plant water supply wells. The applicant justifies the FSAR water supply well information (FSAR Table 2.4-17R) because it better reflects current plant water supply well conditions and because it continues to support the SSAR conclusions that future groundwater withdrawals would likely be from the existing wells or from new wells drilled onsite and that any future additional groundwater use is not expected to impact offsite wells.

The staff reviewed the supplemental information provided in the FSAR describing onsite groundwater use. The well located at the North Anna Nuclear Information Center (NANIC) supplies potable water. The staff requests clarification on whether an alternative groundwater pathway to the NANIC well was considered for use in the FSAR 2.4.13 Accidental Release analysis and, if not, why this pathway was considered implausible

Talking Point 3: FSAR Section 2.4.12

In requesting additional information about the groundwater modeling conducted to evaluate subsurface hydraulic loading, the staff were concerned about three issues: the technical basis for model development, explanation for the high head observed at well OW-901, and the basis for confidence in model predictions. These issues were the subject of RAI 2.4.12-1

The applicant transmitted MODFLOW input files used in the evaluation of post-construction hydraulic loading. Input files for all the simulations described in the groundwater modeling report were received and have been used in the staff's review. Based on the staff's review of the information contained in the FSAR and the groundwater modeling report, the staff concludes that the groundwater model developed by the applicant appropriately represents the site characterization data and the conceptual understanding of site groundwater flow.

The staff would like to discuss additional evidence that the predicted maximum groundwater elevations in the reactor block area are conservative given their dependence on the drains surrounding this area and the observed groundwater heads at well OW-901, which are less than 0.61 m (2.0 ft.) below the design grade. This evidence should include (1) the impact of drain

conductance on predicted groundwater heads in the power block area and (2) the potential for increased recharge along the location of the drains, for example during extreme flood events, and the possible effect on groundwater heads.

Talking Point 4: FSAR Section 2.4.13

The groundwater transport analysis in FSAR 2.4.13 uses a hydraulic conductivity value (1.04 m/d) that is less than the maximum observed value (3.017 m/d) from the site slug tests. This analysis also describes a single transport pathway. In RAI 2.4.13-3 the staff requested technical justification for the hydraulic conductivity value used a discussion of the alternative groundwater transport pathways considered, and a technical justification for the selected pathway being considered conservative. In addition, the staff requested a discussion of the consistency between the MODFLOW model results for post-construction groundwater heads provided in FSAR 2.4.12 and the groundwater transport analysis of FSAR 2.4.13, especially with respect to the conservativeness of the transport analysis and consistency of the transport pathway.

The applicant responded (Letter No. 026 dated October 2, 2008) to the request for technical justification of the hydraulic conductivity value used in the transport analysis by noting that the only slug test results that were greater than 1.04 m/d were obtained upgradient of the reactor building (wells OW-945 and OW-946) and that the calibrated hydraulic conductivity values of the MODFLOW model used in FSAR 2.4.12 were less than 1.04 m/d. The staff note, however, that there is no suggestion in FSAR 2.4.12 that the region around OW-945 and OW-946 should be considered to have a high hydraulic conductivity. While two hydraulic conductivity zones were used in the MODFLOW model, the accidental release transport pathway is located within the higher conductivity zone. The staff also note that the calibrated conductivities are not intended to represent conservative values. The staff concludes that the use of a hydraulic conductivity in the transport analysis of FSAR 2.4.13 other than the maximum observed value is not demonstrably conservative.

The staff would like to discuss additional information to demonstrate compliance with the 10 CFR 20, Appendix B, Table 2 effluent concentration limits, including the limiting value for a radionuclide mixture:

a) On-site measurements of factors affecting groundwater transport are the basis of the analysis.
b) A conservative value of groundwater velocity is based on a conservative (i.e., maximum) estimate of hydraulic conductivity for the selected groundwater transport pathway.
c) A conservative value of a single radionuclide's transport velocity is based on a conservative (i.e., minimum) estimate of the distribution coefficient, K_d. It is acceptable to assume $K_d = 0$ if this results in an acceptable modeled radionuclide concentration at the receptor.
d) A conservative analysis of the limiting concentration value for a mixture of radionuclides that considers the possibility that various radionuclides may arrive simultaneously at the receptor. This analysis should consider the possibility of simultaneous arrival unless this can be ruled out by onsite measurements or acceptable literature values of K_d for specific radionuclides. In particular, the analysis should avoid using nonzero measured or literature K_d values together with assumed zero values of K_d, unless this approach can be otherwise justified, because it could result in unrealistic modeling that shows radionuclides arriving at the receptor at different times whereas, in fact, they might do so. However, it is acceptable to assume $K_d = 0$ for all radionuclides, since this would simulate simultaneous arrival of all radionuclides at the receptor.