PMBelCOL NPEmails

From: Ray, Phillip M [pmray@tva.gov]
Sent: Monday, February 04, 2008 8:49 AM
To: Joseph Sebrosky
Subject: Slides
Attachments: 20080131 DCWG BLN Schedule - Seismic Final Rev-1.pdf; 20080131 DCWG BLN Schedule - Hydro Final Rev-1.pdf; WEC NRC Jan 31 2008Schedule Meetingrevised.pdf

Joe,

That was strange! Try this.

Phillip M. Ray
Senior Project Manager
Nuclear Generation Development
Tennessee Valley Authority
423-751-7030

Hearing Identifier: Bellefonte_COL_NonPublic_EX
Email Number: 1605

Mail Envelope Properties (pmray@tva.gov20080204084851)

Subject: Slides
Sent Date: 2/4/2008 8:48:51 AM
Received Date: 2/4/2008 8:48:51 AM
From: Ray, Phillip M

Created By: pmray@tva.gov

Recipients:
"Joseph Sebrosky" <Joseph.Sebrosky@nrc.gov>
Tracking Status: None

Post Office:

Files	**Size**	**Date & Time**
MESSAGE	154	2/4/2008 8:48:51 AM
20080131 DCWG BLN Schedule - Seismic Final Rev-1.pdf	100196	
20080131 DCWG BLN Schedule - Hydro Final Rev-1.pdf	107308	
WEC NRC Jan 31 2008Schedule Meetingrevised.pdf	266126	

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

NuStart Energy sm

TVA Bellefonte Nuclear Plant

AP1000 R-COL Application Acceptance Review Issues

Discussion of Schedule for Resolution of Seismic Issue

January 31, 2008

Bellefonte 3&4 Lee Nuclear 1&2 Summer 2&3 Vogtle 3&4 Harris 2&3 Levy 1&2

NuStart Energy Development, LLC - All Rights Reserved

Seismology: Introduction

- **NRC Staff have expressed concern over the use of the East Tennessee Seismic Zone (ETSZ) without an update**
  - Low weights assigned by some EPRI/SOG expert teams
  - Section 2.5.2.4.1.3 discusses maximum magnitude; applicant has not addressed other variables
    - Probability of activity
    - Source location
    - Recurrence
  - More recent studies provide new information
    - Geomatrix TVA Dam safety study
    - LLNL Trial Implementation study
  - Significant effects not included in updated PSHA
  - Application does not include detailed numerical comparisons of EPRI-SOG hazard and the newer studies

East Tennessee Seismic Zone

- ***NRC Issue: applicant has not updated ETSZ source models***

- **New studies were considered, but an update was not warranted because the effect on the hazard is not significant**
- **FSAR Section 2.5.2.4.1.3 discusses maximum magnitude**
- **Probability of activity**
  - Considered (not discussed explicitly in COL application)
  - Staff's expectations for different treatment are not clear
- **Source location**
  - Discussed in 2.5.2.4.1.1
- **Recurrence**
  - Discussed in 2.5.2.4.1.2
- **More recent studies cited by Staff**
  - Geomatrix TVA Dam safety study – Ref. 269
  - LLNL Trial Implementation study – Ref. 234

East Tennessee Seismic Zone (continued)

- ***NRC Issue: applicant has not updated ETSZ source models***
  - *Low weights assigned by some EPRI/SOG expert teams (may not adequately characterize the potential for larger earthquakes)*

- **Generic concern with respect to accepted PSHA model and the SSHAC process**
- **Model and SSHAC endorsed by RG 1.165 and RG 1.208**
- **Will be generically discussed at public meeting Feb 13**

East Tennessee Seismic Zone (continued)

- ***NRC Issue: more recent studies provide new information***
  - Geomatrix TVA Dam safety study considered
  - LLNL Trial Implementation study considered
  - Results -
    - Study parameters within EPRI-SOG ranges
    - No update of ETSZ needed

East Tennessee Seismic Zone (continued)

- ***NRC Issue: Significant effects should be included in updated PSHA***
  - Effects were not found to be significant
  - Update of ETSZ input to PSHA was not necessary
- ***NRC Issue: Application does not include detailed numerical comparisons of EPRI-SOG hazard and the newer studies***
  - Effects were not found to be significant
  - COLA guidance does not appear to request this information; not clear why information would be provided in the absence of significant impact

East Tennessee Seismic Zone (continued)

- **Conclusions**
  - PSHA based on accepted/endorsed model
  - Recent studies of ETSZ considered
  - Impacts on ETSZ parameters discussed
  - No significant effects to include in updated PSHA
  - Any remaining details can be adequately addressed in typical RAI timeframes

Bellefonte 3&4 *Lee Nuclear 1&2* *Summer 2&3* *Vogtle 3&4* *Harris 2&3* *Levy 1&2*

NuStart Energy sm

TVA Bellefonte Nuclear Plant

AP1000 R-COL Application Acceptance Review Issues

Discussion of Schedule for Resolution of Hydrology Issue

January 31, 2008

NuStart Energy Development, LLC - All Rights Reserved

Hydrology: Introduction

- **NRC Staff expressed concern over TVA's Simulated Open Channel Hydraulics (SOCH) code**
  - Model description and documentation not cited
  - Question regarding review of materials used to meet 10CFR50 Appendix B QA requirements
- **Potential options cited by Staff:**
  - Update Bellefonte analyses using USACE HEC-RAS model
  - Use bounding calculations to determine design-basis flood
  - Provide model description and documentation to enable NRC Staff review, and possible parallel Staff development of independent numerical model
- **Discussion needed to:**
  - Describe TVA hydrology experience
  - Provide information on supporting documentation
  - Clarify various issues in NRC acceptance letter
  - Propose actions to reach closure on issue and facilitate NRC review

Background: TVA Hydrology Experience

- **TVA created by Congress via TVA Act of 1933, with charter/mission to provide, in part, navigation and flood control to protect inhabitants of Tennessee River Valley**
- **Modeling of Tennessee River Basin covers over 1250 total miles of river, with total drainage area of over 40,000 mi^2, and containing 30 dams analyzed for outflows/failure effects**
- **TVA developed in-house hydrology and hydraulics expertise**
  - Originally conducted analysis by hand
  - Later migrated methods to computer aided computations

Background (continued)

- TVA has long term expertise in flood analyses and modeling of watercourses within Tennessee Valley
- Analytical models and methods, originally developed by TVA's hydrologists and water resource engineers, continue to be used within both nuclear and non-nuclear program areas
- Underlying methods and computer code development (Garrison, Granju, Price - 1969) similar to basic underlying methods used by USACE as building block for HEC-RAS software

Regulatory History

- **TVA model received *"extensive review"* by NRC during licensing of three other nuclear plants in 1970's (NUREG 0011- Sequoyah SER, Browns Ferry SER, and NUREG-0847-Watts Bar SER)**
- **TVA model endorsed by the NRC in NUREG 0800 Section 2.4.4 - *"detailed failure models* [of dams]*...by Tennessee Valley Authority are used..."***
  - Recent revision of NUREG 0800 unclear as to basis for change in citation of TVA model
- **TVA model is currently endorsed in guidance *"Processing Applications for Early Site Permitting"* (RS-002, Section 2.4.4, May 2004) using similar words**
- **Use of SOCH approved in 2007 SER for Sequoyah**

Supporting Documentation

- **Supporting documentation for TVA code does exist and is available for NRC review**
- **History of Analysis Method and SOCH Code**
  - Hand computations originally used to predict flood levels converted to Simulated Open Channel Hydraulics (SOCH) FORTRAN Code in 1960s because no other standardized models available
  - Analysis method published in 1969 in peer-reviewed ASCE Journal

Supporting Documentation

- **SOCH Method/Code (continued)**
  - Analysis inputs updated in 1996 to reflect Dam Safety Program enhancements to dam structures
    - Program enhancements included altering potential failure modes
    - FORTRAN Code not altered
  - Analyses, codes, and supporting documentation collected into single TVA Nuclear Calculation, in compliance with TVA's Appendix B QA requirements and implementing procedures
  - Calculation now resides under TVA Nuclear QA configuration control
    - Supports design and licensing basis of three operating nuclear sites

Clarification of Acceptance Letter

- ***NRC Issue: model description and documentation not cited***
  - Clarification: documented calculation available for review

- ***NRC Issue: question regarding review of materials used to meet 10CFR50 Appendix B QA requirements***
  - Clarification:
    - Use of SOCH model remains consistent with existing fleet licensing basis
    - Calculation is in compliance with TVA's Appendix B QA program requirements and implementing procedures

- ***NRC statement that update to HEC-RAS model is in progress***
  - Clarification: TVA regrets any confusion but has not indicated intent to adopt/apply HEC-RAS model to TVA system reservoirs

TVA Points of Consideration

- **Existing model documentation is adequate for existing fleet and use in fulfilling TVA responsibility for flood control in Tennessee Valley**
  - NRC Staff encouraged to review existing documentation
  - A familiarization workshop on the SOCH model can be made available to assist NRC Staff in recreating ability to review model, as needed, consistent with previous and current NRC guidance
- **Consideration of use of HEC-RAS model**
  - Conversion of SOCH model to HEC-RAS not viable because of undue burden of significant cost and time required to model large and complex Tennessee River drainage basin without significant benefit
  - No regulatory basis for imposition of change
  - No indication existing model is inadequate
  - HEC-RAS would be unique for Bellefonte; Bellefonte would be outlier in TVA nuclear fleet and non-nuclear programmatic areas

TVA Points of Consideration (continued)

- **NRC development of an independent model is not warranted**
  - No technical basis to abandon analysis previously approved by NRC
  - SOCH model previously provided reasonable and accepted results; no changes to code or computational methods have occurred that would suggest previous results are now less reasonable
  - TVA has confidence in development and use of analyses and methods and utilizes them in other non-nuclear programmatic areas

Proposed Approach

- **Maintain use of SOCH model in Bellefonte COL application consistent with other TVA implementation**
- **NRC Staff review SOCH documentation in support of reasonable assurance conclusions**
  - Documentation in accordance with TVA QA program available for review
  - Leverage review experience from 2007 Sequoyah Review
  - Familiarization workshop to facilitate NRC review
- **Approach should**
  - Preclude need for extended schedule for the hydrology review
  - Enable focusing of Staff and applicant resources on risk-significant areas
  - Support reasonable assurance determination regarding use of TVA's Hydraulic Model in predicting maximum flood levels at Bellefonte site

Proposed Schedule

1.	TVA make available calculation, supporting documents, and model description white paper to NRC for review	04/04/08
2.	TVA conduct a familiarization workshop on SOCH code	05/16/08

AP1000 Review Schedule Issues

Westinghouse

Technical Specifications

- Small number of remaining bracketed items in DCD Revision 16
- Additional bracketed items with pending reference
- Plan to resubmit Technical Specifications to remove all remaining bracketed items by mid-February 2008

Westinghouse

Technical Specification Bracketed Status

Tech Spec*	Item	Completion Path
SR 3.1.4.3	Rod drop time – 2.47 sec	2/15/08
TS 3.8.1 / 3.8.7	Battery float current	2/15/08
TS 5.5.8	Air lock leak rate and test pressure	2/15/08
Table 3.3.1-1	Table 3.3.1 Note 1 OTdT and OPdT set point equation uncertainty values	2/15/08
Bases Fig B 3.6.8-1	Time permitted to establish containment closure	2/15/08
3.3.1 / 3.3.2 Completion Times and SR Frequency based on WCAP-10271	TS 3.3.1 and 3.3.2 Completion Times and SR Frequency based on AP1000 design basis documents	2/15/08

* Any associated Bases impacted by the change to the bracketed items will be modified at the same.

Westinghouse

Piping DAC Re-Insertion

- January 2008 re-insertion of Piping DAC to existing Design Certification Rulemaking status
- Identification of COL Holder Items for related COL Information Items
- Plan is to provide detailed piping design information allowing resolution of the DAC and COL Holder Items

Westinghouse

Piping DAC Closure

- Replace current list of methodology criteria (Piping DAC) with system-based design ITAAC
- Initial piping analysis package available for NRC review in April 2008
- ASME Class 1 piping analysis packages for risk significant piping available August 2008
- ASME Class 2 and 3 piping analysis packages for risk significant piping available December 2008

Westinghouse

Pipe Break Hazard Evaluation

- Evaluation of as-designed piping required by a COL Holder Information Item
- Completion expected during COL application review
- Hazard evaluation requires information from piping analysis and does not impact piping design.

Westinghouse

ASME Component Review

- As-designed code reports including reconciliation to the revised seismic spectrum needed to close COL information items
- COL Holder Items were identified for these reports in January 2008 letter
- Plan is to provide the as-designed reports for NRC review during design certification amendment review

Westinghouse

ASME Component Review

- Design specifications for major ASME Code, Section III components are complete except one to be completed in February
- As-designed design reports for major components are scheduled to be complete by July.
- Design specifications for ASME Code auxiliary equipment and valves are complete for several types of valves; the remainder are scheduled to be complete in July.

Westinghouse

Containment Sump/IRWST Screen Design

- GSI 191 Unresolved at Design Certification Rulemaking
- Westinghouse and NRC agreed COL Information Item was appropriate
- COL Information Item 6.3-2
- Technical Report 26 and DCD Revision 16 proposed information to address the COL information Item
- January 18, 2008 docketing letter indicates existing design information as supplemented by TR 147 still remains insufficient for NRC review

Westinghouse

Screen Design Plan

- NRC stated position is that prior to issuing a COL their review will need to confirm acceptability of the screen design through review of:
  - Detailed screen design
  - Screen performance testing
  - Long term cooling analysis
- Review must confirm long term coolability of the core

Westinghouse

Commitments

- Provide additional details on the Containment Recirculation and IRWST screen designs (March 1, 2008)
- Demonstrate by test that the screen designs meet AP1000 screen pressure loss limits (March 1, 2008)
- Demonstrate by analysis and evaluations that downstream effects do not adversely impact long term coolability of the core (March 31, 2008)
- Evaluate existing ITAAC (based on screen surface areas) to identify changes (March 31, 2008)
- Demonstrate by analysis that there is adequate margin between screen performance and AP1000 safety limits (April 30, 2008)

Westinghouse

Steps

- January 31, 2008 Westinghouse letter documenting detailed commitments (deliverables and dates)
- Technical Meeting with NRC staff to discuss details (mid-February)
  - Screen design detail can be previewed
  - Testing complete; results can be discussed
  - Analysis well-underway (methodology and some preliminary results can be discussed in February)
  - Portions of the meeting will be proprietary

Westinghouse

Actions Going Forward

- Screen design and performance NRC review should be able to begin on March 1, 2008
- Remaining deliverables are to confirm core cooling margins
  - Ex-vessel downstream effects
  - In-vessel downstream chemical effects
  - Core cooling sensitivity to screen pressure drop
  - Low amounts of debris and chemicals in AP1000 design result in these analyses not expected to be challenging
- NRC action to review proposal and confirm by letter that the planned deliverables will allow review schedule development

Westinghouse