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Attachments: NRC - Response to NOV.pdf

Enclosed is the Letter Dated april 18, 2008 to

NRC - Response to Notice of Violation

<<NRC - Response to NOV.pdf>>

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From: Creek, Carolyn P

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Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

April 18, 2008

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

10 CFR 2.201

In the Matter of)
Tennessee Valley Authority)

Docket No. 52-014
52-015

BELLEFONTE COMBINED LICENSE APPLICATION - NRC INSPECTION REPORT NO. 05200014/2008-001 AND 05200015/2008-001 - RESPONSE TO NOTICE OF VIOLATION (NOV)

This letter provides the Tennessee Valley Authority's (TVA's) response to the NOV which is documented in the subject inspection report dated March 19, 2008.

The violations discussed resulted from inadequate implementation of the design control process as it related to the Simulated Open Channel Hydraulics (SOCH) model and a failure to use prescribed quality-related procedures as required by the quality assurance program. The Enclosure to this letter documents the actions taken and remaining actions to be taken related to each notice of violation.

TVA has separately provided the plan to address the NRC-identified technical issues related to the Bellefonte (BLN) Units 3&4 COL application probable maximum flood hydrology calculation (TVA letter from J. A. Bailey to R. W. Borchardt dated March 14, 2008). The TVA letter provides a schedule for delivering code documentation to the NRC in support of an NRC site visit to be conducted the week of June 23, 2008. NRC has documented its receipt of the TVA plan and has indicated that they will re-evaluate the Bellefonte COL application review schedule after the June 23, 2008 meeting (NRC letter T. A. Bergman to A. S. Bhatnagar, dated March 25, 2008). The deliverables in June are expected to be sufficient to allow the NRC to perform the technical review of the Bellefonte COL application on the schedule transmitted to TVA on February 15, 2008. In June 2008, TVA will provide schedule revisions, as necessary, for the activities described in the March 14, 2008 letter and a date when final compliance will be achieved.

If you should have any questions, please contact me at 423-751-7119.

Sincerely,

Andrea L. Sterdis
Manager, New Nuclear Licensing and Industry Affairs
Nuclear Generation Development & Construction

Enclosure

cc :

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M. Concepcion, NRC/NRO/DCIP/CQVP
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ENCLOSURE
BELLEFONTE COMBINED LICENSE APPLICATION
NRC INSPECTION REPORT
NO. 05200014/2008-001 AND 05200015/2008-001
REPLY TO NOTICE OF VIOLATION (NOV)

VIOLATION: 05200014/2008-001-01and 05200015/2008-001-01

RESTATEMENT OF VIOLATION

Criterion III, "Design Control," of Appendix B to 10 CFR Part 50 states, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

TVA-NQA-PLN89-A, "Nuclear Quality Assurance Plan," Revision 18, dated December 4, 2007, Section 7.0, "Design Control," provides measures to ensure that applicable specified design requirements, such as design bases, regulatory requirements, and codes and standards, are correctly translated into specifications, drawings, procedures, or instructions. Specifically, Subsection 7.2.1.B states, in part, that design activities shall be documented in sufficient detail to permit verifications and audits.

TVA procedure NEDP-2, "Design Calculation Process Control," Revision 0, dated August 5, 1997, provides the requirements and instructions for the preparation, review, approval, issue, and revision of calculations and the preparation, review, and approval of calculation data used for TVA nuclear power plants. Subsection 3.1.9 states that the use of computer software shall comply with SPP-2.6, "Computer Software Control," and the documentation should be adequate to allow a qualified design verifier to reproduce the calculation results without recourse to the preparer. Subsection 3.2, "Calculation Procedure," states, in part, that the preparer develops sufficiently detailed calculations so that a qualified design verifier can independently review, understand, and reproduce the calculation results or verify the adequacy of the results without recourse to the preparer.

TVA procedure SPP-2.6, "Computer Software Control," Revision 0, dated July 14, 1997, provides the controls for computer software used in support of design, operation, modification, and maintenance of TVA nuclear plants to ensure the integrity of software output. Additionally, Appendix C to SPP-2.6 states, in part, that the validation test procedure, results, and software verification and validation report are quality assurance (QA) records.

Contrary to the above, as of February 22, 2008, TVA had not implemented the design control process as required by the TVA nuclear quality assurance plan. Specifically, objective evidence was not available during the inspection to confirm that verification and validation activities were conducted by TVA to ensure that the SOCH computer model and supporting programs used for predictions of flood levels, in support of the combined license application at the Bellefonte site, adequately and correctly performed all intended functions. This issue has been identified as Violation 05200014/2008-001-01 and 05200015/2008-001-01.

ENCLOSURE
BELLEFONTE COMBINED LICENSE APPLICATION
NRC INSPECTION REPORT
NO. 05200014/2008-001 AND 05200015/2008-001
REPLY TO NOTICE OF VIOLATION (NOV)

TVA's REPLY TO VIOLATION 05200014/2008-001-01and 05200015/2008-001-01

(1) The Reason for the Violation

TVA's SOCH model is a legacy code, developed by TVA hydrology subject matter experts in river systems operation over a period of several years. The code history preceded current QA software requirements. However, the SOCH software has been controlled using good engineering practices by TVA. Such practices, though undocumented in many cases, included comparisons of model outputs against previous results to confirm the ability to replicate values, as well as the initialing and dating of work in accordance with processes in place at the time of the model development.

When the 1998 calculation package was issued to document the 1998 SOCH model runs for the Flood Reassessment for the Effects of Dam Safety Modifications, TVA incorrectly assumed that additional design review to confirm the verification and validation of the SOCH model was not warranted since this legacy code had been the subject of numerous NRC reviews connected with previous licensing activities which did not question the model's flood level results. TVA acknowledges that previous NRC reviews should not have been relied upon to establish compliance with TVA's requirements for code Verification and Validation or for control of design inputs.

(2) Corrective Steps Taken and Results Achieved

TVA is developing software verification and validation documentation, consistent with the process defined by SPP 2.6. This will demonstrate that the software used for the flood analyses provided in the Bellefonte COL application meets the QA software requirements. TVA has established a plan to implement the verification and validation consistent with SPP 2.6. Implementation of the independent verification step for three of the SOCH sub-programs utilizing an independent analysis has been performed and is undergoing review. The plan will be applied for the remaining sub-programs and the SOCH calculational code.

(3) Corrective Steps that will be Taken to Prevent Recurrence

TVA will document the specific version of the SOCH hydrology software and its supporting sub-code software in accordance with the requirements of SPP 2.6, consistent with the TVA QA plan. Such documentation will include the necessary verification and validation elements for QA software. TVA will issue a revision to the 1998 Reassessment Calculation to acknowledge the use of the QA V&V code, and the specific version of the code used.

ENCLOSURE
BELLEFONTE COMBINED LICENSE APPLICATION
NRC INSPECTION REPORT
NO. 05200014/2008-001 AND 05200015/2008-001
REPLY TO NOTICE OF VIOLATION (NOV)

TVA has initiated three Problem Evaluation Reports (PERs) to address evaluate the issues identified by the inspection. The three PERs are:

1. PER 138753, "Difference between NQAP and SPP-2.6"
2. PER 138749, "Insufficient identification of design input data"
3. PER 141213, "Extent of Condition evaluation of TVA supplied information in support of the Bellefonte COL application"

In regards to PER 141213, TVA has undertaken an extent of condition evaluation of the Bellefonte COL application FSAR to identify any additional potential software uses with non-validated codes.

(4) Date When Full Compliance Will Be Achieved

Full compliance will be achieved in accordance with the activities defined in TVA's March 14, 2008, letter to NRC in which TVA has provided the necessary commitments for resolving the technical issues related to the hydrology calculation used in the Bellefonte COL application. TVA's March 14 2008, letter documents the specific actions that are underway to allow NRC staff technical review of the probable maximum flood calculations utilized in the COL application. In June 2008, TVA will provide schedule revisions, as necessary, for the activities described in the March 14, 2008, letter and a date when final compliance will be achieved.

VIOLATION: 05200014/2008-001-02 and 05200015/2008-001-02

RESTATEMENT OF VIOLATION

Criterion III of Appendix B to 10 CFR Part 50 states, in part, that design control measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in §50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions.

TVA-NQA-PLN89-A, Subsection 7.2.2.A states, in part, that design assumptions, design inputs, and deviations from approved design inputs shall be identified, reviewed, approved, and documented prior to declaring the structure, system, or component affected by the design operable. Subsection 7.2.6.A states, in part, that the translation of design inputs into design documents shall be verified and the verification documented.
Subsection 6.3.2.A states, in part, that sufficient records and documentation shall be prepared and maintained to provide evidence of quality of items or activities affecting quality.

QA records shall be legible, complete, and identifiable to the item involved. NEDP-2, Section 3.1.22, states that for computer input files in support of activities such as reanalysis, evaluations and operability assessments, evidence shall be included that either indicates the electronic storage location of any supporting computer input files or certifies that the input files need not be electronically stored. NEDP-2 further states that an electronic file does not constitute the QA Record of the analysis input. To satisfy this requirement, a hard copy/microfiche of the input file must be included in the documentation of the quality-related analysis.

Contrary to the above, on February 22, 2008, TVA's 1998 Flood Reassessment for the Effects of Dam Safety Modifications calculation package did not contain a hard copy/microfiche of the input files. Additionally, TVA was unable to produce copies of all input files for the SOCH model's supporting programs or provide objective evidence that design inputs had been controlled in accordance with NEDP-2 and the TVA QA program. This issue has been identified as Violation 05200014/2008-001-02 and 05200015/ 2008-001-02.

TVA's REPLY TO VIOLATION 05200014/2008-001-02and 05200015/2008-001-02

(1) The Reason for the Violation

As previously stated, the SOCH model is a TVA legacy code, developed by TVA hydrology subject matter experts in river systems operation. When the TVA river systems operations staff collected design input data for each SOCH model run, including the 1998 run, they also verified it as accurate. The existence and verification of design input data was not thoroughly recorded in the TVA 1998 calculation package later used to support the Bellefonte COL application.

When the 1998 calculation package was issued to document the 1998 SOCH model runs for the Flood Reassessment for the Effects of Dam Safety Modifications, TVA did not include all design input data used to define the Tennessee River basin in the calculation package, since this legacy code had been successfully used in numerous NRC reviews for previous licensing activities and the model and most of its inputs had not changed.

TVA incorrectly assumed that the NRC would agree that previous regulatory reviews of the TVA SOCH model would be sufficient confirmation that river system design input control had been applied in the SOCH data collection and input, and that the SOCH model provides accurate computational results.

(2) Corrective Steps Taken and Results Achieved

TVA is in the process of confirming and documenting the design inputs used by the SOCH hydrology software and its sub-codes. This effort will lead to a complete set of verified design input documentation that will be traceable back to the source documents, and will be captured, consistent with NEDP-2 requirements, in a revision to the 1998 Reassessment Calculation.

The resulting set of documents and verified design inputs will be made available for NRC review to support the regulatory review of the Bellefonte COL application. TVA has established a process for confirming the design inputs and has an assembled team performing the tasks. Significant progress has been made and the input data documentation assembled to this point is consistent with that used in the hydrology calculation. TVA has established a process for reconciling anomalous input data and is implementing this process as necessary. TVA has performed an extent of condition evaluation that considered other TVA input data used in the BLN Units 3&4 COL application. No additional occurrences have been identified.

(3) Corrective Steps that will be Taken to Prevent Recurrence

TVA will issue a revision to the 1998 Reassessment Calculation to document the verification effort related to design inputs, and to acknowledge the use of the specific SOCH software version that meets TVA's QA verification and validation requirements.

In regards to PER 141213, TVA has undertaken an extent of condition evaluation of the Bellefonte COL application FSAR to identify any additional potential software uses with non-validated and documented inputs.

(4) Date when Full Compliance will be Achieved

See the previous response to NRC violations 05200014/2008-001-01 and 05200015/2008-001-01

VIOLATION: 05200014/2008-001-03and 05200015/2008-001-03

RESTATEMENT OF VIOLATION

Criterion V, "Instructions, Procedures, and Drawings" of Appendix B to 10 CFR Part 50 states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

TVA-NQA-PLN89-A, Section 6.1.1, states, in part, that the QA program requires that quality-related activities shall be prescribed by documented procedures and instructions appropriate to the circumstances.

Activities shall be accomplished in accordance with these procedures and instructions. NEDP-2, Section 3.1.9, states in part that the use of computer software shall comply with SPP-2.6 and that the documentation should be adequate to allow a qualified design verifier to reproduce the calculation without recourse to the preparer.

SPP-2.6, states, in part, that SPP-2.6 functions as the Software Quality Assurance Plan (SQAP) and Software Verification and Validation Plan (SVVP) for computer software used to support the design, operation, modification, and maintenance of TVA's nuclear power plants unless otherwise noted.

Contrary to the above, as of February 22, 2008, TVA had not implemented procedure SPP-2.6 for the 1998 Flood Reassessment for the Effects of Dam Safety Modifications calculation package. At the time of the inspection, TVA could not provide objective evidence that the 1998 calculation package had been implemented in a manner consistent with NEDP-2 for:

1) verifying and validating the SOCH model;

2) documenting the design inputs in the 1998 calculation; and

3) maintaining the above information as quality assurance records.

This issue has been identified as Violation 05200014/2008-001-03 and 05200015/ 2008-001-03.

TVA's REPLY TO VIOLATION 05200014/2008-001-03 and 05200015/2008-001-03

(1) The Reason for the Violation

The TVA Software QA Program requirements applicable in 1998 were defined in TVA-NQA-PLN89-A, Rev 7 (10/09/96), Section 13. Section 13.1 references the criteria listed in Appendix E to determine when QA software requirements apply. Appendix E states in part that, "The requirements of Section 13.0 (Computer Software) apply to application software which … 5. Performs engineering calculations, *the results of which are used, without further verification* to support the design of safety-related and quality-related structures, systems, and components." - Emphasis added. TVA SPP-2.6, applicable in 1998, further translated the criteria for applying QA Software requirements by stating in Section 1.0, PURPOSE, that further application of QA controls is not required provided the output of the software ... "gives the user confidence that the output of the software is correct and can be used *without further review* for its intended purpose."

In addition, NEDP-2, Design Calculation Process Control, applicable in 1998, states in Subsection 3.2.2 Preparation, M.2, "Ensure the computer program has been verified, documented, and is controlled in accordance with SPP-2.6. See note below."
The referenced note below states, "**NOTE** Calculations/analysis may be performed on non-QA software as long as checking and reviewing and other requirements of this procedure are met…"

Therefore, TVA determined that the output of the SOCH software must either:

a. Apply the QA software requirements of SPP-2.6, if the output of the software is to be used without further review, or
b. Apply the requirements of NEDP-2 related to the use of legacy or other non-QA software by applying the requirements for checking and reviewing.

Notwithstanding the above, TVA acknowledges that objective evidence was not presented to the NRC reviewers during the February 2008 inspection to confirm that SOCH model verification and validation activities had been conducted by TVA. As discussed previously, TVA also acknowledges that documentation to demonstrate the existence and verification of design input had not been thoroughly documented in the TVA 1998 calculation package used to support the BLN COL application. TVA further acknowledges that the results of these efforts have not been maintained as QA records for this legacy code.

The reasons for this violation are identified in responses to the previous two NRC violations (05200014/2008-001-01 & 05200015/2008-001-01 and 05200014/2008-001-02 & 05200015/2008-001-02). During the review, TVA acknowledged that SPP-2.6 or the design calculation SPP, or both, should be clarified. PER 138753 has been initiated to address this issue.

(2) Corrective Steps Taken and Results Achieved

See the previous response to NRC violations (05200014/2008-001-01 & 05200015/2008-001-01 and 05200014/2008-001-02 & 05200015/ 2008-001-02).

(3) Corrective Steps that will be Taken to Prevent Recurrence

See the previous response to NRC violations (05200014/2008-001-01 & 05200015/2008-001-01 and 05200014/2008-001-02 & 05200015/ 2008-001-02).

(4) Date When Full Compliance will be Achieved

See the previous response to NRC violations 05200014/2008-001-01 and 05200015/2008-001-01.