



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

September 28, 2012

10 CFR 2.201
10 CFR 50.9(b)

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Browns Ferry Nuclear Plant, Units 1, 2, and 3
Facility Operating License Nos. DPR-33, DPR-52, and DPR-68
NRC Docket Nos. 50-259, 50-260, and 50-296

Subject: **Updated Reply to Notice of Violation; EA-11-252; and Follow-up to 10 CFR 50.9, "Completeness and accuracy of information," Notification**

- References:
1. Letter from NRC to TVA, "Browns Ferry Nuclear Plant - NRC Inspection Procedure 95003 Supplemental Inspection Report 05000259/2011011, 05000260/2011011, and 05000296/2011011 (Part 1)," dated November 17, 2011
 2. Letter from TVA to NRC, "Response to an Apparent Violation in Inspection Report 05000259/2011011, 05000260/2011011, 05000296/2011011; EA-11-252," dated December 19, 2011
 3. Letter from NRC to TVA, "Browns Ferry Nuclear Plant - Notice of Violation NRC Inspection Report 05000259/2012010, 05000260/2012010, and 05000296/2012010," dated January 23, 2012
 4. Letter from TVA to NRC, "Reply to Notice of Violation; EA-11-252," dated February 22, 2012

In accordance with the NRC letter dated November 17, 2011 (Reference 1), the Tennessee Valley Authority (TVA) submitted a response to Apparent Violation EA-11-252 (Reference 2). Subsequently, NRC issued Notice of Violation EA-11-252 on January 23, 2012 (Reference 3). In accordance with the Reference 3 letter, TVA was required to respond to the Notice of Violation within 30 days of the date of the letter (i.e., February 22, 2012). The TVA response to this notice of violation, including

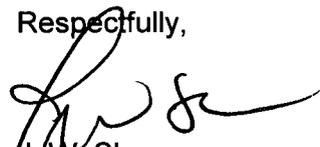
IEOI
RGM II

information regarding extent of condition reviews, was provided in the Reference 4 letter in accordance with 10 CFR 2.201, "Notice of violation." In the Reference 4 letter, it was indicated that the actions associated with the extent of condition reviews were expected to be complete by September 28, 2012. However, the effort needed to complete these reviews has been determined to be greater than originally planned. As a result, the approach for performing these reviews and the expected completion date have been revised as reflected in Enclosure 1.

In addition, as part of the ongoing extent of condition reviews, on September 4, 2012, TVA determined that information previously provided to the NRC in certain Browns Ferry Nuclear Plant (BFN) license amendment requests and associated responses to NRC requests for additional information was incomplete. As required by 10 CFR 50.9(b), a notification was made within two working days, i.e., on September 6, 2012, to the NRC Region II office via a telephone call between K. J. Polson, BFN Site Vice President, with other TVA representatives and NRC Region II representatives F. D. Brown (acting on behalf of V. M. McCree, NRC Region II Administrator) and E. F. Guthrie. As requested during that telephone call, TVA is providing a follow-up to that notification as part of this updated reply to the notice of violation. The requested information is provided in Enclosure 2.

There are no new regulatory commitments contained in this response. Should you have any questions concerning this submittal, please contact James Emens at (256) 729-2636.

Respectfully,



J. W. Shea
Vice President, Nuclear Licensing

Enclosures:

1. Updated Reply to Notice of Violation; EA-11-252
2. Follow-up to 10 CFR 50.9, "Completeness and accuracy of information," Notification

cc (Enclosures):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Browns Ferry Nuclear Plant

ENCLOSURE 1

Tennessee Valley Authority

Browns Ferry Nuclear Plant, Units 1, 2, and 3

Updated Reply to Notice of Violation; EA-11-252

Restatement of Violation

10 CFR 50.9 requires, in part, that information provided to the Commission by an applicant for a license or by a licensee or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects.

Contrary to the above, on January 6, 1997, and on May 5, 2004, TVA provided information to the Commission that was not complete and accurate in all material respects, related to NRC Generic Letter 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance" testing program. Specifically, in a letter dated January 6, 1997, TVA responded to a prior NRC question and stated that "Closure of valves FCV-74-52 and FCV-74-66 is not required by plant procedures to operate the RHR system in the suppression pool cooling mode. Therefore, these valves have no 'redundant' safety function and will not be included in the GL 89-10 program." This information was inaccurate because the FCV-74-52 and FCV-74-66 valves do have a safety function to shut to operate the RHR system in the suppression pool cooling mode as described in EOI Appendix-17A, "RHR System Operation Suppression Pool Cooling," and should therefore have been included in Browns Ferry's GL 89-10 MOV monitoring program.

Additionally, TVA also provided incomplete and inaccurate information in a letter to NRC dated May 5, 2004. This letter referenced 18 valves, including FCV-74-52 and FCV-74-66, "that are not in the GL 89-10 program since the valves are normally in their safety position." This letter stated that "TVA's review and documentation of the design basis for the operation of each Unit 1 MOV within the scope of the GL 89-10 program, the methods for determining and adjusting its switch settings, testing, surveillance and maintenance are the same as with the Units 2 and 3 program."

This information was material to the NRC because it was used, in part, as the basis for determining that valves FCV-74-52 and FCV-74-66 did not meet the conditions necessary that would require them to be in Browns Ferry's GL 89-10 MOV monitoring program.

Background

Tennessee Valley Authority (TVA) incorrectly determined that flow control valves FCV-74-52 and FCV-74-66 were "passive" based on operating in their safety position during normal alignment. Additionally, TVA failed to identify that FCV-74-52 and FCV-74-66 are required to be closed to enable Residual Heat Removal (RHR) to operate to the suppression pool cooling mode, per Emergency Operating Instruction (EOI) Appendix-17A.

By letter dated January 6, 1997, TVA responded to NRC inspector follow-up item 50-260, 296/95-19-01 regarding the reduced scope of motor-operated valves (MOVs) in the NRC Generic Letter (GL) 89-10, "Safety-Related Motor-Operated Valve Testing

Updated Reply to Notice of Violation; EA-11-252

and Surveillance,” program for Browns Ferry Nuclear Plant (BFN), Units 2 and 3. This letter stated in part that “Closure of valves FCV-74-52 and FCV-74-66 is not required by plant procedures to operate the RHR system in the suppression pool cooling mode. . .” As a result, FCV-74-52 and FCV-74-66 were removed from the GL 89-10 program in 1997, in accordance with Supplement 1 to GL 89-10.

As identified during the root cause analysis conducted to address the issues associated with the failure of FCV-74-66 in BFN, Unit 1, TVA discovered that the statement “Closure of valves FCV-74-52 and FCV-74-66 is not required by plant procedures to operate the RHR system in the suppression pool cooling mode. . .” was inaccurate. Specifically, the revision of the EOI, Appendix-17A, that was in place in January 1997 included a step to verify that the FCV-74-52 or FCV-74-66 valve was closed as part of performing the steps to place the RHR system in the suppression pool cooling mode. As required by 10 CFR 50.9(b), TVA provided written notification to the NRC by letter dated October 20, 2011, acknowledging the inaccuracy of its January 6, 1997 letter. Additionally, TVA provided written notification to the NRC by letter dated December 19, 2011, acknowledging the inaccuracy of its May 5, 2004, letter.

With respect to FCV-74-52 and FCV-74-66 and the GL 89-10 program, TVA will implement the following actions.

- Add 1, 2, 3 - FCV-74-52 and 1, 2, 3 - FCV-74-66 to the GL 89-10 program.
- Develop or revise an existing procedure to specifically provide the criteria for determining GL 89-10 program scope, including active/passive classification.

Reason for the Violation

The reasons for this violation of 10 CFR 50.9, “Completeness and accuracy of information,” are as follows.

- TVA failed to apply adequate technical rigor to the review process for regulatory submittals. The responsible licensing engineer was requested by a reviewer of the January 1997 submittal to verify the statement regarding closure of valves FCV-74-52 and FCV-74-66. Verification was done through verbal confirmation from Engineering without documentation supporting the conclusion.
- TVA procedures did not contain sufficient details governing the verification process for regulatory submittals. The TVA procedures in place at the time of the 1997 letter only provided guidance on acceptable methods of verification. In addition, the procedure stated that method of verification remained at the discretion of the technical lead; not the responsible licensing engineer.
- TVA personnel assigned to the BFN, Unit 1, restart licensing failed to follow procedures governing the verification process for regulatory submittals. The information provided in the May 5, 2004, letter related to BFN, Unit 1, was verified to the extent required to ensure the BFN, Unit 1, valves were described

Updated Reply to Notice of Violation; EA-11-252

in a manner equivalent to the BFN, Units 2 and 3 valves. As stated in the 2004 letter, the basis for excluding the BFN, Unit 1, valves from the GL 89-10 program was the same as the BFN, Units 2 and 3, valves.

Corrective Steps That Have Been Taken and Results Achieved

As stated above, TVA provided written notification to the NRC by letter dated October 20, 2011, acknowledging the inaccuracy of its January 6, 1997, letter, in accordance with 10 CFR 50.9(b). Additionally, TVA provided written notification to the NRC by letter dated December 19, 2011, acknowledging the inaccuracy of its May 5, 2004, letter.

Procedural requirements in TVA procedure BP-213, "Managing TVA's Interface with NRC," governing the verification of information contained in NRC submittals were enhanced in 2002. These enhancements, which included the following, are contained in the current revision of BP-213:

- Designating oversight responsibility for the submittal verification process to Licensing.
- Specifying which NRC submittals require verification.
- Describing which types of statements in NRC submittals require verification.
- Providing detailed requirements for verification packages.

With respect to the failure of BFN, Unit 1, restart licensing personnel to follow the procedure governing the verification process for regulatory submittals (i.e. BP-213), procedure use and adherence has since been reinforced as one of TVA's fundamental human performance tools. Management expectations regarding procedure use and adherence are communicated regularly through TVA Nuclear corporate and site communications and are further reinforced through TVA's Nuclear Fleet Focus Handbook.

Extent of Condition

Misapplication of the criteria for determination of active/passive function of 1-FCV-74-66 resulted in inappropriate classification and removal from the GL 89-10 program. This contributed to the untimely identification of the valve failure. This misapplication of the criteria also resulted in providing the NRC inaccurate information in associated correspondence and submittals used by the NRC in making the decision to approve the exclusion of the FCV-74-52 and FCV-74-66 valves from the BFN GL 89-10 program. As a result, the extent of condition is considered to include submittals to the NRC that included information describing the results of TVA's application of criteria for defining the scope of regulatory programs.

To address this extent of condition, the following actions will be taken.

Updated Reply to Notice of Violation; EA-11-252

For the following regulatory programs, applicable information submitted to the NRC in other BFN GL 89-10 submittals, other BFN, Unit 1, restart submittals, and other BFN, Units 2 and 3, submittals related to these regulatory programs, starting from time of program development, will be identified.

- Air Operated Valve Program
- Aging Management Program
- Breaker Testing and Maintenance Program
- Buried Cable Program
- Buried Piping/Groundwater Protection Program
- Equipment Qualification Program
- Flow Accelerated Corrosion Program
- Inservice Inspection Program
- Inservice Testing Program
- Instrument Setpoint Program
- Maintenance Rule Program
- Motor Operated Valve Program
- Primary Containment Leakage Rate Testing Program
- Seismic Monitoring Instrumentation Program
- Equipment Seismic Qualification Program
- Snubber Program
- Pump Program
- Motor Program
- Heat Exchangers Program
- Chillers Program
- Probabilistic Risk Assessment Program
- Appendix R Program
- Reactor Vessel Internals Program

Using guidance derived from TVA procedure BP-213, each of the NRC submittals identified for these regulatory programs will be reviewed to validate that the information associated with the program scope provided to the NRC was complete and accurate as required by 10 CFR 50.9. Any information that cannot be validated as complete and accurate will be documented in the TVA Corrective Action Program (CAP).

In accordance with procedure NPG-SPP-03.5, "Regulatory Reporting Requirements," the information documented in the TVA CAP that could not be validated will be reviewed and evaluated to determine if the condition is reportable in accordance with 10 CFR 50.9.

The TVA will notify the NRC in accordance with 10 CFR 50.9(b) for identified conditions that meet the reporting requirements delineated in 10 CFR 50.9.

As part of the ongoing extent of condition reviews, on September 4, 2012, TVA determined that information previously provided to the NRC in certain Browns Ferry Nuclear Plant (BFN) license amendment requests and associated responses to NRC requests for additional information was incomplete. As required by 10 CFR 50.9(b), a

Updated Reply to Notice of Violation; EA-11-252

notification was made within two working days, i.e., on September 6, 2012, to the NRC Region II office via a telephone call. As requested during that telephone call, TVA is providing a follow-up to that notification as part of this updated reply to the notice of violation. The requested information is provided in Enclosure 2.

Corrective Steps That Will Be Taken

All identified corrective actions to avoid future violations have been implemented.

The results of the extent of condition reviews and any required NRC notifications are expected to be completed by February 1, 2013.

Date When Full Compliance Will Be Achieved

For the 10 CFR 50.9 violation described in EA-11-252, TVA achieved full compliance with the October 20, 2011, and December 19, 2011, NRC notification letters.

ENCLOSURE 2

Tennessee Valley Authority

Browns Ferry Nuclear Plant, Units 1, 2, and 3

**Follow-up to 10 CFR 50.9, "Completeness and accuracy of information,"
Notification**

**Follow-up to 10 CFR 50.9, "Completeness and accuracy of information,"
Notification**

On September 4, 2012, as part of the ongoing extent of condition reviews for corrective actions for the Notice of Violation EA-11-252, the Tennessee Valley Authority (TVA) determined that information previously provided to the NRC in certain Browns Ferry Nuclear Plant (BFN) license amendment requests and associated responses to NRC requests for additional information was incomplete. As required by 10 CFR 50.9(b), a notification was made within two working days, i.e., on September 6, 2012, to the NRC Region II office via a telephone call between K. J. Polson, BFN Site Vice President, with other TVA representatives and NRC Region II representatives F. D. Brown (acting on behalf of V. M. McCree, NRC Region II Administrator) and E. F. Guthrie. As requested during that telephone call, TVA is providing this follow-up to that notification.

Alternate Leakage Treatment (ALT) was credited by TVA for BFN in NRC submittals to increase Main Steam Isolation Valve (MSIV) leakage acceptance criteria and to allow use of Alternative Source Term (AST). The submittals containing information that have been determined to be incomplete are as follows.

- The MSIV leakage acceptance criteria increase submittals for BFN, Units 2 and 3, dated September 28, 1999 (Reference 2), and February 4, 2000 (Reference 3).
- The MSIV leakage acceptance criteria increase submittal for BFN, Unit 1, dated July 9, 2004 (Reference 4).
- The AST submittal for BFN, Units 1, 2, and 3, dated August 24, 2004 (Reference 5).

The NRC Safety Evaluation Report (SER) for NEDC-31858P, Revision 2, "BWROG Report for Increasing MSIV Leakage Rate Limits and Elimination of Leakage Control Systems," dated March 3, 1999 (Reference 1), required the following to be addressed.

"In parallel to the plant-specific reviews conducted in the past, the staff determined that all licensees referencing the generic report should provide assurance for the reliability of the entire ALT pathway, including all of its boundary valves. The licensees should also provide assurance that valves required to open the ALT path to the condenser are provided with highly reliable power sources, and that a secondary path to the condenser with orifice flow exists. In addition, valves which are required to open the ALT path to the condenser are to be included in the plant's Inservice Testing (IST) program."

The TVA submittals dated September 28, 1999 (Reference 2), and July 9, 2004 (Reference 4), addressed compliance with NEDC-31858P and the associated SER (Reference 1) and stated that valves in each of the four drain lines from the main steam lines (flow control valves (FCVs) 1-168, 1-169, 1-170, and 1-171) are normally open motor operated valves which would remain open on loss of offsite power. However, these submittals should have also described that if any MSIV is closed and turbine speed is greater than 1700 revolutions per minute (rpm), these valves close and will reopen after turbine speed drops below 1700 rpm. As a result, these TVA submittals failed to address the following:

**Follow-up to 10 CFR 50.9, "Completeness and accuracy of information,"
Notification**

- Reliability of power sources for these valves. Valves FCVs 1-168, 1-169, 1-170, and 1-171 are powered from non-safety related motor operated valve boards that do not have emergency diesel generator (EDG) back-up power supplies.
- Reliability of valve logic to reopen the valves to establish the ALT pathway.
- The need to include these valves in the IST Program. These valves were not included in the IST Program, even though they close upon MSIV closure and are required to reopen.

The TVA submittals dated September 28, 1999 (Reference 2), and July 9, 2004 (Reference 4), stated that two valves in the piping line downstream of the four main steam line drain lines prior to the condenser (FCV 1-58 and FCV 1-59) are normally closed valves which would require operator action to align the ALT path to the condenser. These TVA submittals also stated that these two valves are powered from essential power buses with EDG back-up and to further ensure valve reliability, these valves would be included in the IST program and periodically stroke tested. One of these valves (FCV-1-59) has a 4-inch bypass containing no valves or orifices. Therefore, there is not a concern associated with FCV-1-59 with respect to ALT pathway availability. The TVA submittals dated July 9, 2004 (Reference 4), and August 24, 2004 (Reference 5), also stated that these valves (FCV 1-58 and FCV 1-59) are designed to be available during and after a Loss of Coolant Accident (LOCA) event concurrent with loss of offsite power. However, these submittals should have also described that the reactor motor operated valve board that powers FCV 1-58 is not qualified for the post-LOCA environment, e.g., temperature, and is also required to be manually loaded onto the associated EDG. As a result, the TVA submittals failed to adequately address the reliability of the power source for FCV 1-58 after a LOCA.

The TVA submittals dated September 28, 1999 (Reference 2), February 4, 2000 (Reference 3), July 9, 2004 (Reference 4), and August 24, 2004 (Reference 5), indicate that a secondary orificed contingency path is provided in the unlikely event of a failure of the normally closed valve without the 4-inch bypass line (FCV 1-58) in the piping line downstream of the four main steam line drain lines prior to the condenser. For BFN, the secondary ALT pathway consists of orificed bypass lines around each of the four drain lines (FCV 1-168, 1-169, 1-170, and 1-171) from the main steam lines through an open valve (FCV 1-57) in the piping line downstream of the four main steam line drain lines and then through an orificed bypass line around a normally closed valve (FCV 1-58) and finally through a non-orificed 4-inch bypass line around another closed valve (FCV 1-59) to the condenser. These TVA submittals also stated that with the 0.1875 inch orificed path around FCV 1-58, it is calculated that the majority of MSIV leakage would still be directed to the condenser with a smaller remainder through the closed Main Steam Stop/Control Valves to the high pressure turbine. However, no TVA calculation supporting the statement regarding the 0.1875 inch orifice has been located.

TVA determined that this condition was reportable to the NRC in accordance with 10 CFR 50.9(b) on September 4, 2012, and the notification was made to the NRC Region II office within two working days, on September 6, 2012.

Follow-up to 10 CFR 50.9, "Completeness and accuracy of information," Notification

This condition has been included in the TVA Corrective Action Program. Efforts are currently underway to evaluate this condition to determine if the causes of the condition are the same as the causes associated with the previous 10 CFR 50.9 violation, i.e., failure to apply adequate technical rigor to the review process for regulatory submittals, procedures not containing sufficient details governing the verification process for regulatory submittals, and failure of BFN, Unit 1, restart licensing personnel to follow procedures governing the verification process for regulatory submittals. It is expected that the causes associated with this condition will be similar to the causes associated with the previous 10 CFR 50.9 violation and that this condition represents an additional example. The causal evaluation will also identify immediate corrective actions and corrective actions to prevent recurrence.

The identified issues with the ALT pathway are being treated as a non-conforming/degraded condition. A Functional Evaluation has been performed that relies on the secondary ALT pathway. While no TVA calculation supporting statement regarding the 0.1875 inch orifice was located as previously discussed, it has been determined that actual leakage flow area through the Main Steam Stop and Control Valves, based on actual BFN Main Steam Stop and Control Valve testing performed each refueling outage, is less than assumed in the BFN LOCA dose analysis of record. With this decrease, the existing BFN LOCA dose analysis of record remains bounding.

Consistent with NRC guidance for resolving non-conforming/degraded conditions, final corrective actions for this condition may involve the following:

1. Full restoration to be consistent with the described conditions in the licensing submittals;
2. A change to the licensing basis to accept the as-found condition as is; or
3. Some modification of the facility or licensing basis other than restoration to the conditions as described in the licensing submittals.

References

1. NRC letter to General Electric, "Safety Evaluation Report of GE Topical Report, NEDC-31858P, Revision 2, BWROG Report for Increasing MSIV Leakage Limits and Elimination of Leakage Control Systems, September 1993," dated March 3, 1999
2. TVA letter to NRC, "Browns Ferry Nuclear Plant - Units 2 and 3 - Technical Specification (TS) Change 399 - Increasing Main Steam Isolation Valve (MSIV) Leakage Rate Limits and Exemption from 10 CFR 50, Appendix J," dated September 28, 1999
3. TVA letter to NRC, "Browns Ferry Nuclear Plant - Units 2 and 3 - Response to Request for Additional Information Regarding Technical Specification (TS) Change 399 - Increased Main Steam Isolation Valve (MSIV) Leakage Rate Limits and Exemption from 10 CFR 50, Appendix J - Revised TS Pages for MSIV Leakage Limits," dated February 4, 2000

**Follow-up to 10 CFR 50.9, "Completeness and accuracy of information,"
Notification**

4. TVA letter to NRC, "Browns Ferry Nuclear Plant Unit 1 - Technical Specification (TS) Change 436 - Increased Main Steam Isolation Valve (MSIV) Leakage Rate Limits and Exemption from 10 CFR 50, Appendix J," dated July 9, 2004
5. TVA letter to NRC, "Browns Ferry Nuclear Plant - Units 1, 2, and 3 - Supplemental Information Associated with Response to Request for Additional Information (RAI) Related to Technical Specification (TS) Change No. TS-405 - Alternative Source Term (AST)," dated August 24, 2004