



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

August 23, 2013

EA-13-118

Mr. Joseph W. Shea  
Vice President, Nuclear Licensing  
Tennessee Valley Authority  
1101 Market Street, LP 3D-C  
Chattanooga, TN 37402-2801

**SUBJECT: FINAL SIGNIFICANCE DETERMINATION OF WHITE FINDING AND NOTICE OF VIOLATION [NRC INSPECTION REPORT NO. 50000260/2013013, BROWNS FERRY NUCLEAR PLANT]**

Dear Mr. Shea:

This letter provides you the final significance determination of the preliminary White finding discussed in NRC Inspection Report Nos. 05000259/2013002, 05000260/2013002 and 05000296/2013002, dated May 14, 2013 (ML13134A237). This finding involved the failure to properly implement procedure 2-OI-99, Reactor Protection System (RPS), which resulted in a failure to reenergize the 2B RPS Bus and an inappropriate action to de-energize the 2A RPS bus. This caused a Unit 2 reactor SCRAM and main steam isolation valve (MSIV) closure.

At your request, a Regulatory Conference was held on July 24, 2013, to discuss your views on this issue. A copy of the handout you provided at this meeting was included in the meeting summary that was issued on July 30, 2013 (ML13212A084). During the meeting, Tennessee Valley Authority (TVA) staff described your assessment of the significance of the finding, and the corrective actions taken to resolve it, including the root cause evaluation of the finding. Specifically, TVA agreed with the performance deficiency and violation, as written. You determined that the root cause of the performance deficiency was the failure to fully implement industry recommendations and guidance on organizational and operational decision making. The corrective actions to prevent recurrence include development and implementation of a change management plan to transition plant manipulations performed by unit supervisors/senior reactor operators to unit operators and assistant unit operators.

During the regulatory conference TVA presented a different consideration for performing the significance determination process (SDP) calculation. Specifically, you stated that the performance deficiency, on its own, would not directly lead to a full SCRAM with MSIV closure. Your staff explained that one RPS bus was already deenergized and should not be included in the performance deficiency risk assessment. You noted that if a half SCRAM was analyzed through the SDP, it would screen as a Green finding prior to a Phase 3 analysis being required. Your staff also presented a regulatory analysis in a memorandum dated July 19, 2013

(ML13204A094), which considered plant conditions at the time the performance deficiency occurred. The associated delta core damage frequency was determined through a change in the initiating event frequency times conditional core damage probability. The revised initiating event frequency calculation was 0.15/year, which TVA indicated resulted in a Green finding of very low safety significance.

The NRC considered the information you presented at the conference, and we disagree with your position that the performance deficiency only led to a half SCRAM. When determining their response to the loss of power to the 2B RPS bus, plant operators chose to attempt to restart the 2B RPS motor generator set and restore power by performing Section 5.1 of 2-OI-99, Reactor Protection System. The operator failed to restore power to the 2B RPS bus and incorrectly de-energized the one remaining (2A) RPS bus, which directly led to a reactor SCRAM and closure of the MSIVs.

The performance deficiency is now clarified as, "The licensee failed to properly implement procedure 2-OI-99, Reactor Protection System (RPS) in that an operator failed to re-energize the 2B RPS Bus and inappropriately de-energized the 2A RPS bus, which resulted in a Unit 2 reactor SCRAM and MSIV closure."

Since the performance deficiency caused an actual full SCRAM and MSIV closure, the NRC disagrees with the approach described in your July 19, 2013 letter, which assumed a reduction in initiating event frequency based on past performance. The NRC determined that evaluation of the operator's failure to follow procedure 2-OI-99 as a full SCRAM with MSIV closure was the appropriate representation of the increase in risk to the public of the event resultant from the performance deficiency. Since the finding resulted in a full SCRAM and MSIV closure, the staff assessed the conditional core damage probability (CCDP) of the event to estimate the significance of the finding. You acknowledged that your calculations of CCDP of the event were comparable to the NRC's calculations previously conveyed in NRC Inspection Report No. 05000260/2013012, dated June 11, 2013 (ML13162A780). The CCDP calculated by the NRC has been converted to a change in core damage frequency (CDF) by subtracting the base case CCDP and normalizing over a one year period resulting in a change in CDF of 4.1E-6/year.

After considering the information developed during the inspection and the information you provided at the regulatory conference, the NRC has concluded that the finding is appropriately characterized as White, or as having low-to-moderate safety significance.

You have 30 calendar days from the date of this letter to appeal the staff's determination of significance for the identified White finding. Such appeals will be considered to have merit only if they meet the criteria given in the IMC 0609, Attachment 2. An appeal must be sent in writing to the Regional Administrator, Region II, 245 Peachtree Center Ave, NE, Suite 1200, Atlanta, GA 30303.

The NRC has also determined that the failure to properly implement procedure 2-OI-99, Reactor Protection System, is a violation of Technical Specification 5.4.1.a, Procedures, as cited in the attached Notice of Violation (Notice). The circumstances surrounding the violation were described in detail in NRC Inspection Report Nos. 05000259/2013002, 05000260/2013002 and 05000296/2013002 (ML13134A237). In accordance with the NRC Enforcement Policy, the Notice is considered escalated enforcement action because it is associated with a White finding.

The NRC has concluded that the information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance will be achieved is already adequately addressed on the docket in the meeting summary for the regulatory conference that was issued on July 30, 2013 (ML13212A084). Therefore, you are not required to respond to this letter unless the description therein does not accurately reflect your corrective actions or your position.

On May 14, 2013, the NRC assessed the performance of Browns Ferry Nuclear Plant Unit 2 to be in the Degraded Cornerstone column of the Reactor Oversight Process Action Matrix beginning the fourth quarter of 2012 based on two White inputs into the Mitigating Systems Cornerstone. Because this White finding is an input into the Initiating Events Cornerstone, the NRC has assessed the performance of Browns Ferry Nuclear Plant Unit 2 to remain in the Degraded Cornerstone column of the Reactor Oversight Process Action Matrix beginning the fourth quarter of 2012, in accordance with IMC 0305, Operating Reactor Assessment Program. This letter supplements, but does not supersede, the assessment follow-up letter issued on May 14, 2013 (ADAMS Accession Number ML13134A237).

The NRC will conduct a supplemental inspection (Inspection Procedure 95001) when you have notified us of your readiness for the NRC to review the actions taken to address this issue. This inspection procedure is conducted to provide assurance that the root and contributing causes for the individual and collective risk significant performance issues are understood, to independently assess the extent of condition, to provide assurance that the corrective actions are sufficient to prevent recurrence, and to independently determine if safety culture components caused or significantly contributed to individual and collective risk-significant performance issues.

For administrative purposes, this letter is issued as NRC Inspection Report 05000260/2013013. AV 05000260/2013002-02, Failure to Follow Operating Procedure Guidance Resulted in Unit 2 Reactor Scram, is updated consistent with the regulatory positions described in this letter as VIO 05000260/2013002-02 with a safety significance of White and a cross-cutting aspect of Human Error Prevention in the Work Practices component of the Human Performance area [H.4.(a)].

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from

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the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Sincerely,

*/RA/*

Victor M. McCree  
Regional Administrator

Docket No.: 50-260  
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Enclosure: Notice of Violation

J. Shea

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Letter to Joseph W. Shea from Victor M. McCree dated August 23, 2013

SUBJECT: FINAL SIGNIFICANCE DETERMINATION OF WHITE FINDING AND NOTICE OF VIOLATION [NRC INSPECTION REPORT NO. 50000260/2013013, BROWNS FERRY NUCLEAR PLANT]

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## NOTICE OF VIOLATION

Tennessee Valley Authority  
Browns Ferry Nuclear Plant  
Unit 2

Docket No. 50-260  
License No. DPR-52  
EA-13-118

During an NRC inspection completed on March 31, 2013 a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Technical Specification 5.4.1, requires in part, that written procedures be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978.

Regulatory Guide 1.33, Revision 2, Appendix A, Paragraph 4 addresses "Procedures for Startup, Operation, and Shutdown of Safety-Related Boiling Water Reactor Systems" and lists item y, "Reactor Protection System," as a system for which instructions should be prepared, as appropriate, for energizing, filling, venting, draining, startup, shutdown, and changing modes of operation.

Contrary to the above, on December 22, 2012, the licensee did not properly implement a procedure recommended in Regulatory Guide 1.33, Revision 2, Appendix A, dated February 1978. Specifically, on December 22, 2012, the licensee failed to properly implement the procedure for Startup, Operation, and Shutdown of the Reactor Protection System, 2-OI-99, Reactor Protection System, step 5.1[3], when an operator incorrectly opened the RPS motor generator set tie to battery board 2 Breaker on the A RPS bus motor generator set while attempting to start the B RPS bus motor generator set. The failure to properly implement 2-OI-99 caused a Unit 2 reactor SCRAM and MSIV closure.

This violation is associated with a White significance determination process finding for Unit 2, in the Initiating Events cornerstone.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence and the date when full compliance will be achieved is already adequately addressed on the docket in in the meeting summary for the regulatory conference that was issued on July 30, 2013 (ML13212A084). However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," include the EA number, and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region II, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

Enclosure

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 23<sup>rd</sup> day of August 2013

Enclosure