



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
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June 22, 2012

EA-12-133

Mr. J.W. Shea  
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**SUBJECT: NRC REPORT 05000259/2012012, 05000260/2012012, AND  
05000296/2012012; PRELIMINARY WHITE FINDING AT BROWNS FERRY  
NUCLEAR PLANT**

Dear Mr. Shea:

This letter discusses one finding preliminarily determined to be White, that is, a finding of low to moderate increased safety significance that may require additional NRC inspections. The finding involved the failure to adequately accomplish the requirements contained in procedure NPG-SPP-09.3 "Plant Modifications and Engineering Change Control" which required that an evaluation of training needs be completed to support implementation of Design Change Notice (DCN) 69957. Specifically, on September 13, 2011, Procedures 0-SSI-25-1,-2,-3, and -26, "Safe Shutdown Instructions," were issued in support of DCN 69957 without adequately performing an evaluation of training needs. As a result, the systems approach to training was not properly implemented and the procedures could not be satisfactorily performed by plant operators and staff.

This finding was assessed based on the best available information, using the applicable Significance Determination Process (SDP) and was determined utilizing Inspection Manual Chapter 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria." The final resolution of this finding will be conveyed in separate correspondence.

Following the initial review of this matter using preliminary quantitative analysis, Appendix M was used considering the uncertainties in the bounding analysis and the insights from the qualitative review. There is a lack of quantitative data and probabilistic risk assessment tools to accurately assess the risk significance of the performance deficiency in a timely manner. Specifically, the failure to adequately identify and perform required training for implementation of procedures for combating plant fire events affected the licensee's ability to respond to a plant fire. Based on the qualitative and quantitative analyses, this NRC identified finding has preliminarily been determined to have low to moderate safety significance (White).

The finding is also an apparent violation (AV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and was documented as Apparent Violation 05000259, 260, 296/2012-007-05, Failure to Properly Implement the Requirements of the Plant Modifications and Engineering Change Control Procedure, in NRC Inspection Report (IR) 05000259,260,296/2012007 (ML12150A219). This AV is being considered for escalated enforcement action in accordance with the Enforcement Policy, which can be found on the NRC's Web site at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>.

In accordance with NRC Inspection Manual Chapter (IMC) 0609, we intend to complete our evaluation using the best available information and issue our final determination of safety significance within 90 days of the date of the referenced report. The significance determination process encourages an open dialogue between the NRC staff and the licensee; however, the dialogue should not impact the timeliness of the staff's final determination.

Before we make a final decision on this matter, we are providing you with an opportunity (1) to attend a Regulatory Conference where you can present to the NRC your perspective on the facts and assumptions the NRC used to arrive at the finding and assess its significance, or (2) submit your position on the finding to the NRC in writing. If you request a Regulatory Conference, it should be held within 30 days of the receipt of this letter and we encourage you to submit supporting documentation at least one week prior to the conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation. If you decide to submit only a written response, such submittal should be sent to the NRC within 30 days of your receipt of this letter. If you decline to request a Regulatory Conference or submit a written response, you relinquish your right to appeal the final SDP determination, in that by not doing either, you fail to meet the appeal requirements stated in the Prerequisite and Limitation sections of Attachment 2 of IMC 0609.

Please contact Eugene Guthrie at 404-997-4662 and in writing within 10 days from the issue date of this letter to notify the NRC of your intentions. If we have not heard from you within 10 days, we will continue with our significance determination and enforcement decision.

Because the NRC has not made a final determination in this matter, no Notice of Violation is being issued for these inspection findings at this time. In addition, please be advised that the number and characterization of the apparent violation described in the referenced inspection report may change as a result of further NRC review.

J. Shea

3

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and the Enclosure 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>.

Sincerely,

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Richard P. Croteau, Director  
Division of Reactor Projects

Docket Nos.: 50-259, 50-260, 50-296  
License Nos.: DPR-33, DPR-52, DPR-68

Enclosures: Appendix M Significance Determination Process Using  
Qualitative Criteria – Table 4.1

cc w/encl: (See page 4)

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4

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5

Letter to Joseph W. Shea from Eugene Guthrie dated June 22, 2012

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05000296/2012012; PRELIMINARY WHITE FINDING AT BROWNS FERRY  
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**APPENDIX M  
SIGNIFICANCE DETERMINATION PROCESS  
USING QUALITATIVE CRITERIA  
TABLE 4.1**

**Qualitative Decision-Making Attributes for NRC Management Review**

Although the Quantitative Risk-Informed SDP is the preferred path for determining the significance of findings in the Reactor Oversight Process, in this case Appendix M was used because the existing guidance is not adequate to provide a reasonable estimate of the significance. The NRC has made a qualitative determination of the significance by focusing on the 8 attributes in the table below.

The significance of the finding is driven by the potential consequences of operators not properly implementing procedures to combat plant fire events. Proper implementation of the SSIs, including integration with the implementation of other plant procedures, is required during major fire events to ensure proper operator actions are taken to; 1) place all 3 Units into a safe condition; 2) prevent negative effects of spurious equipment operation; and 3) protect designated safe shutdown equipment and its associated power supplies from any fire related damage, in order to ensure safe shutdown and prevent core damage. The success of these procedures is heavily dependent on the knowledge, skills and abilities of the operators responsible for procedure implementation, and the proper evaluation and implementation of operator training is essential to the knowledge, skills and abilities of the operators.

Based on the magnitude of the ignition sources and because fire is a significant contributor to the overall plant risk, the judgment of the SRA is that this performance deficiency is greater than green. Appendix I, Licensed Operator Requalification SDP, of IMC-609 was used to risk inform the Appendix M evaluation and help bound the significance of the finding. The performance deficiency is of Low to Moderate Safety Significance (White), based on a qualitative assessment of Appendix M attributes.

<b>Decision Attribute</b>	<b>Applicable to Decision?</b>	<b>Basis for Input to Decision – Provide qualitative and/or quantitative information for management review and decision making.</b>
Finding can be bounded using qualitative and/or quantitative information?	YES	<p>In an effort to evaluate the significance in a timely manner, the guidance found in IP 71111.11, Licensed Operator Requalification Program for evaluating crew performance during the simulator portion of the annual operating test and the criteria found in Appendix I, Licensed Operator Requalification Significance Determination Process (SDP), of MC-609 was used to bound the significance of the finding.</p> <p>This guidance establishes a bounding significance to similar scenarios based on the criteria found in Appendix I. Appendix I states that a failure of more than 40% of the crews on the simulator portion of the operating test indicates significant deficiencies in operator knowledge and would result in a White SDP determination. This is derived from the concept that deficiencies in the level of knowledge and abilities of licensed operators can have a direct impact on the risk and safety of a plant.</p>

Enclosure

Decision Attribute	Applicable to Decision?	Basis for Input to Decision – Provide qualitative and/or quantitative information for management review and decision making.
		<p>To assess the extent of the level of knowledge of the operators and how that potentially affected the overall risk and safety of the plant at the time of the violation (when the procedures were issued), the following was taken into consideration:</p> <ol style="list-style-type: none"> <li>1. 5 months <u>after</u> the procedures were issued, operators exhibited a significant lack of knowledge of, and demonstrated an inability to implement, the new SSIs as indicated by the following observations during a simulator training scenario: <ul style="list-style-type: none"> <li>• The crew was not able to perform required time critical actions as prescribed in the SSIs.</li> <li>• One crew member did not understand that the “TBD” identifiers listed before each step cross-referenced specific technical basis for the actions contained in the step.</li> <li>• Several of the crew members needed to be instructed on the location of the technical bases for the procedure.</li> <li>• The crew was coached to postpone entering the EOIs when valid entry conditions existed until all ten-minute SSI actions were completed. However, this implementation strategy was not described in the new SSIs and was never addressed during the previous operator training; in fact, previous training directed the operators to enter the EOIs when entry conditions were met.</li> <li>• Following closure of the main steam isolation valves (MSIVs), the crew attempted to control reactor pressure manually by cycling the main steam relief valves (MSRVs). The crew was coached to not take manual control of the MSRVs. However, during a subsequent simulator observation, the inspectors were informed that the operators were being given inappropriate instruction and taking manual control of reactor pressure was the appropriate action.</li> <li>• The simulator exercise terminated at the point where the SSI ten-minute actions were completed and were never exposed to conditions where integration with procedural actions outside the SSIs would occur, even though this was the major difference in implementation strategy between the new SSIs and the existing SSI procedures.</li> <li>• A training evaluation had never been performed to determine the scope and objectives of the training scenarios to ensure operators received appropriate levels of training.</li> </ul> </li> </ol>

	<ol style="list-style-type: none"> <li>2. During additional training provided to address the concerns of the inspectors, questions and discussions between the operators showed a clear lack of knowledge of the basics of the procedures and their implementation.</li> <li>3. After the additional training was completed, the crew observed by the inspectors was also unable to satisfactorily implement the time critical actions of the procedure.</li> <li>4. The failure of the crew to implement the time critical actions was not identified by the training and operations staff observing the scenario until the NRC inspectors raised the issue with the staff. The crew received remedial training and successfully completed the time critical actions during a second attempt at the scenario</li> </ol> <p>Both crews observed by inspectors demonstrated having significant issues in procedure understanding and implementation. Other staff members, including those responsible for training and oversight of operators, also displayed a lack of knowledge associated with these procedures. This was indicative of a pervasive deficiency in the level of knowledge and proficiency associated with these procedures.</p> <p>The observed operator level of knowledge and proficiency issues were determined to most likely be the current norm of capability for the operators and was even less capable when the procedures were issued, based on the following:</p> <ul style="list-style-type: none"> <li>• A review of the training provided prior to the implementation of the new procedures was negligible.</li> <li>• No simulator training was provided to operators until the LOR Cycle 1 training, which began on January 30, 2012 (approx 4.5 months after procedure issuance.)</li> <li>• The staff responsible for training the operators were discovered to have knowledge deficiencies and were providing negative training to operators.</li> <li>• Operators and supervisors exhibited knowledge deficiencies during interviews and discussions with inspectors.</li> <li>• The integration of EOI/AOI procedures with SSIs is a new method of procedure implementation for the site.</li> </ul> <p>It was concluded that based on the inspection findings that there is a very high probability the majority of the operators had unacceptable levels of knowledge and proficiency associated with the new SSIs when the new procedures were implemented. This would be consistent with the significance of a WHITE finding as determined in Appendix I for &gt;40% demonstration deficiencies in operator level of knowledge &amp; abilities.</p>
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Defense-in-Depth affected?	Yes	<p>The term “defense in depth” is commonly associated with the maintenance of the integrity and independence of the three fission product barriers. In addition, redundant and diverse safety systems, including trained licensed operators conducting operations in accordance with approved station procedures that were developed under an approved quality control program are integral to maintaining a “defense in depth.”</p> <p>This performance deficiency revealed operational weaknesses in the training and level of knowledge of licensed plant operators which had the potential to erode the defense in depth of the plant’s safety. The operating crew plays a vital role in the maintenance of “defense in depth” from the perspective that they implement the procedures that contain the predetermined strategies to mitigate plant events and ensure the plant safety. Human errors due to a lack of knowledge of the strategies and procedures can lead to consequences that have the potential to compromise plant safety.</p>
Performance Deficiency effect on the Safety Margin maintained?	No	This performance deficiency had the potential to adversely affect the margin of safety but was not associated with an actual event.
The extent the performance deficiency affects other equipment.	Yes	Because this issue is rooted partially in the ineffectiveness of the training program to identify the training needs and knowledge requirements of operators, it has the potential to affect the overall level of knowledge of the entire operations staff without detection until an actual event that requires a missing skill or piece of knowledge is required.
Degree of degradation of failed or unavailable component.	N/A	N/A
Period of time (exposure time) effect on the performance deficiency.	Yes	The exposure period is relatively short ~150 days – therefore increased risk above the lower bound of White is unlikely through other risk analysis. But the exposure time would be greatly reduced had the licensee taken the correct actions when the issue was identified and entered into their CAP.

<p>The likelihood that the licensee's recovery actions would successfully mitigate the performance deficiency.</p>	<p>No</p>	<p>"Recovery Actions" are expected to be rooted in training operators about these specific procedures. But this issue spans multiple site departments and TVA corporate offices, and actions to mitigate future occurrences are not yet fully identified or implemented.</p>
<p>Additional qualitative circumstances associated with the finding that regional management should consider in the evaluation process.</p>	<p>Yes</p>	<ul style="list-style-type: none"> <li>• Multiple layers of procedure requirements were improperly implemented or ignored.</li> <li>• Decisions were made outside of established procedures to allow this condition to exist.</li> <li>• TVA missed multiple additional opportunities to identify and prevent this finding.             <ol style="list-style-type: none"> <li>1. Licensee failed to perform a systematic analysis of the new job requirements contained in the SSI's in accordance with the systems approach to training.</li> <li>2. The underlying issue associated with the level of training provided was identified and conveyed to the licensee by an NRC inspector 2 months prior to this inspection. Yet when the issue was discussed with the Training Manager he did not know such an NRC observation was in the CAP.</li> </ol> </li> </ul>