



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

April 19, 2010

EA-09-307

Mr. Preston D. Swafford
Chief Nuclear Officer and Executive Vice President
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

**SUBJECT: FINAL SIGNIFICANCE DETERMINATION OF YELLOW AND WHITE FINDINGS
AND NOTICE OF VIOLATION (NRC INSPECTION REPORT NOS.
05000259/2010007, 05000260/2010007 AND 05000296/2010007), BROWNS
FERRY NUCLEAR PLANT**

Dear Mr. Swafford:

This letter provides you the final significance determination of three preliminary Greater than Green findings discussed in NRC Inspection Report 05000259/2009009, 05000260/2009009 and 05000296/2009009, dated January 20, 2010 (ML100201056). The inspection findings were assessed using the NRC's Significance Determination Process and were preliminarily characterized as Greater than Green, which represent findings with at least low to moderate safety significance that may require additional NRC inspection. Two of the findings involved multiple examples of the failure to satisfy requirements of 10 CFR Part 50, Appendix R, Sections III.G.1 and III.G.2. The third finding involved an inappropriate revision to the Browns Ferry post-fire safe shutdown instruction entry conditions, which resulted in the safe shutdown instruction not meeting the requirements of Technical Specification (TS) 5.4.1.a. The NRC's Inspection Report also identified three apparent violations corresponding to these three findings.

At your request, a Regulatory Conference was held on February 22, 2010, to discuss your views on these issues. During the meeting, your staff described the Tennessee Valley Authority's (TVA) assessment of the significance of the findings, root causes, and detailed corrective actions. Regarding the two 10 CFR 50, Appendix R findings, TVA's risk assessment concluded that the risk significance of the findings should be characterized as White. Due to the commonality of the root causes, TVA also concluded that these two findings should be combined into one finding, resulting in one violation of 10 CFR 50, Appendix R. TVA concluded that the significance of the finding regarding post-fire safe shutdown instructions should be characterized as Green, and did not contest the validity of the corresponding TS violation.

After considering the information developed during the inspection and information provided by TVA during and after the conference, the NRC concluded that the two findings related to 10 CFR Part 50, Appendix R should be characterized as one Yellow finding, a finding of substantial safety significance that will require additional NRC inspection. Specifically, in multiple fire areas designated by TVA as meeting the requirements of 10 CFR Part 50,

Appendix R, Section III.G.1, cables of redundant trains of systems were not protected such that one train of systems necessary for achieving and maintaining hot shutdown conditions would remain free of fire damage. Additionally, in multiple fire areas, TVA failed to ensure that one train of cables of redundant systems or equipment necessary to achieve and maintain hot shutdown conditions (located in the same fire area) would remain free of fire damage by one of the means described in 10 CFR Part 50, Appendix R, Section III.G.2. These conditions existed since the restart of each Browns Ferry unit (Unit 2 in 1991, Unit 3 in 1995, Unit 1 in 2007). The NRC also determined that a violation of 10 CFR 50, Appendix R, Section III.G occurred, as cited in the enclosed Notice of Violation (Notice) (Enclosure 1) and is associated with this finding. In this case, the NRC agreed with TVA that the violation of 10 CFR Part 50, Appendix R, Section III.G.1, and the violation of 10 CFR Part 50, Appendix R, Section III.G.2, were due, in part, to similar root causes, and therefore should be combined into one violation of 10 CFR 50, Appendix R, Section III.G. The NRC concluded that this violation has a cross-cutting aspect in the Corrective Action Program component of the Problem Identification and Resolution area specifically P.1(c), in that Browns Ferry did not identify and thoroughly evaluate the problem, and the resolution did not adequately address causes and extent of condition. The NRC's bases for the cross-cutting aspects related to this violation are discussed in Enclosure 2.

Browns Ferry was receiving enforcement discretion for this noncompliance under Enforcement Guidance Memorandum (EGM) 98-002, SECY-06-0010 (71 FR 11169; March 6, 2006) and EGM 07-004, which ended on March 6, 2009. On March 4, 2009, TVA submitted their letter of intent to transition to National Fire Protection Association Standard 805 (NFPA 805). In order to be eligible for enforcement discretion under NFPA 805, in accordance with the Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues, you must have submitted your letter of intent to transition to NFPA 805 by December 31, 2005; therefore, you cannot receive discretion for previously identified noncompliances.

The NRC also concluded that the risk significance of the finding regarding the revision to the post-fire safe shutdown instruction entry conditions should be characterized as White, a finding of low to moderate safety significance, which will also require additional NRC inspection. The bases for the NRC's significance determinations are discussed in Enclosure 2. In addition, the failure to establish, implement, and maintain an adequate procedure (Procedure 0-SSI-001, "Safe Shutdown Instructions") for combating a plant fire event is a violation of Technical Specification 5.4.1.a, as cited in the enclosed Notice.

In accordance with the NRC's Enforcement Policy, the Notice is considered an escalated enforcement action, because it is associated with Yellow and White findings.

You have 30 calendar days from the date of this letter to appeal the staff's significance determination for these findings. Such appeals will be considered to have merit only if they meet the criteria given in NRC Inspection Manual Chapter 0609, Attachment 2.

For administrative purposes, this letter is issued as a separate NRC Inspection Report, No. 05000259/2010007, 05000260/2010007 and 05000296/2010007. Apparent Violations 05000259/2009009, 05000260/2009009 and 05000296/2009009-03 and -04 related to Appendix R are now combined as one violation, Violation 05000259, 260, 296/2009009-03, "Failure to Ensure One Train of Cables of Systems Necessary to Achieve and/or Maintain Post-Fire Safe Shutdown is Free of Fire Damage in Accordance With 10 CFR Part 50, Appendix R,

Section III.G.” Apparent Violation 05000259, 260, 296/2009009-05, “Inadequate Safe Shutdown Instruction Entry Conditions for Appendix R Fire Events” is now Violation 05000259, 260, 296/2009009-05, “Inadequate Safe Shutdown Instruction Entry Conditions for Appendix R Fire Events.”

Because plant performance for these issues has been determined to be beyond the licensee response band of the NRC Action Matrix, we will use the Action Matrix to determine the appropriate NRC response. We will notify you, by separate correspondence, of that determination.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response.

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 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. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such information, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). The NRC also includes significant enforcement actions on its Web site at <http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/>.

Sincerely,

/RA/

Luis A. Reyes
Regional Administrator

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

Enclosures:

1. Notice of Violation
2. NRC Basis for Final Significance Determination

cc w/encls: (See page 4)

Section III.G." Apparent Violation 05000259, 260, 296/2009009-05, "Inadequate Safe Shutdown Instruction Entry Conditions for Appendix R Fire Events" is now Violation 05000259, 260, 296/2009009-05, "Inadequate Safe Shutdown Instruction Entry Conditions for Appendix R Fire Events."

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Sincerely,
/RA/
 Luis A. Reyes
 Regional Administrator

Docket Nos.: 50-259, 50-260, 50-296
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1. Notice of Violation
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cc w/encs: (See page 4)

***SEE PREVIOUS CONCURRENCE**

X PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE X NON-SENSITIVE
 ADAMS: Yes ACCESSION NUMBER: _____ X SUNSI REVIEW COMPLETE **MXT**

OFFICE	RII:DRS	RII:DRS	RII:DRS	RII:DRS	RII:DRP	RII:DRS	RII:EICS
SIGNATURE	MXT /RA/	WGR /RA/	JDH /RA/	RLN /RA/	Via email		
NAME	MTHOMAS	WROGERS	JHANNA	RNEASE	EGUTHRIE	KKENNEDY	CEVANS
DATE	4/05/2010	4/05/2010	4/05/2010	4/05/2010	03/31/2010	4/ /2010	4/ /2010
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
OFFICE	OE	NRR	RII:ORA	RII:ORA			
SIGNATURE	VIA EMAIL	VIA EMAIL		LAR /RA/			
NAME			VMcCREE	LREYES			
DATE	4/ /2010	4/ /2010	4/ /2010	4/16/2010			
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

TVA

4

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Letter to Mr. Preston D. Swafford from Mr. Luis A. Reyes dated April 19, 2010.

SUBJECT: FINAL SIGNIFICANCE DETERMINATION OF YELLOW AND WHITE FINDINGS
AND NOTICE OF VIOLATION (NRC INSPECTION REPORT NOS.
05000259/2010007, 05000260/2010007 AND 05000296/2010007), BROWNS
FERRY NUCLEAR PLANT

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NOTICE OF VIOLATION

Tennessee Valley Authority
Browns Ferry Nuclear Plant
Units 1, 2, and 3

Docket Nos. 50-259, 50-260, and 50-296
License Nos. DPR-33, DPR-52, and DPR-68
EA-09-307

During an NRC inspection completed on January 19, 2010, two violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

1. Title 10 of the Code of Federal Regulations (10 CFR), Part 50.48(b)(1) requires that all nuclear power plants licensed to operate prior to January 1, 1979, must satisfy the applicable requirements of 10 CFR Part 50, Appendix R, Sections III.G, III.J, and III.O.

Section III.G requires fire protection of safe shutdown capability.

Section III.G.1 requires fire protection features shall be provided for structures, systems, and components important to safe shutdown. These features shall be capable of limiting fire damage, such that one train of systems necessary for achieving and maintaining hot shutdown conditions is free of fire damage.

Section III.G.2 requires, in part, that where cables and equipment of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located in the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided:

- a. separation of cables and equipment by a fire barrier having a 3-hour rating; or
- b. separation of cables and equipment by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. Fire detection and automatic fire suppression shall be installed in the fire area; or
- c. enclosure of cables and equipment of one redundant train in a fire barrier having a 1-hour fire rating. Fire detection and automatic suppression shall be installed in the fire area.

Contrary to the above, since the restart of each unit (Unit 2-1991, Unit 3-1995, Unit 1-2007) and as of January 20, 2010, the date of the inspection report, the licensee had not met nor has met, as of the date of this NOV, the requirements of 10 CFR Part 50, Appendix R, Section III.G, in that:

(i) fire protection features capable of limiting fire damage were not provided for structures, systems, and components important for safe shutdown. Specifically, the Tennessee Valley Authority (licensee) failed to provide fire protection features capable of limiting the fire damage such that one train of systems necessary to achieve and maintain hot shutdown conditions was free from fire damage in Fire Area 8 along with 19 other fire areas designated in the Browns Ferry Fire Protection Report, as required by 10 CFR Part 50, Appendix R, Section III.G.1.

(ii) where cables and equipment of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located in the same fire area, the licensee did not ensure that one of the redundant trains was free of fire damage by

providing one of the following means: (a) a 3-hour rated fire barrier; (b) 20 feet of spatial separation (free of intervening combustibles and fire hazards) with detection and suppression installed in the fire area; or (c) a 1-hour rated fire barrier with detection and suppression installed in the fire area. Specifically, cables associated with the RHRSW Pump A1, RHR Pump 1A, and LPCI injection valve 1-FCV-74-53 in Fire Area 1/Fire Zone 1-4 are some of the many examples in which the licensee failed to ensure that one train of cables of redundant systems or equipment necessary to achieve and maintain hot shutdown conditions, located in the same fire area, outside of primary containment was free of fire damage by one of the means described in 10 CFR Part 50, Appendix R, Section III.G.2.

This violation of 10 CFR Part 50, Appendix R, Section III.G is associated with a Yellow significance determination process finding for Units 1, 2, and 3 in the Mitigating Systems cornerstone.

2. Technical Specification 5.4.1.a requires that written procedures be established, implemented, and maintained covering the activities in NRC Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, Appendix A, February 1978.

Regulatory Guide 1.33, Appendix A, Section 6.v, requires procedures for combating emergencies, such as plant fires. Embodied within these requirements is the requirement that the procedures are adequate.

Procedure 0-SSI-001, "Safe Shutdown Instructions," Revision 2, specified the licensee's fire emergency response for certain major plant fire events.

Contrary to the above, the licensee failed to establish, implement, and maintain an adequate procedure for combating a plant fire event. On December 23, 2008, the licensee revised the entry conditions of Procedure 0-SSI-001, "Safe Shutdown Instructions," such that response to a major fire event would have been delayed or prevented. This revision resulted in the procedure being inadequate. Specifically, the licensee added a reactor vessel water level entry criterion which would have required operators to remain in the emergency operating instructions until reactor vessel water level decreased to less than +2 inches narrow range, thus delaying or preventing establishment of safe shutdown conditions during a postulated major fire event.

This violation is associated with a White significance determination process finding for Units 1, 2, and 3 in the Mitigating Systems cornerstone.

Pursuant to the provisions of 10 CFR 2.201, the Tennessee Valley Authority is hereby required to submit a written statement or explanation 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). This reply should be clearly marked as a "Reply to a Notice of Violation; EA-09-307" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed

correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

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.

Because 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> to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

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

Dated this 19th day of April 2010

NRC'S BASES FOR FINAL SIGNIFICANCE DETERMINATION

The NRC's inspection report of January 20, 2010, documented the preliminary significance determination of three preliminary Greater than Green findings involving the Browns Ferry Nuclear Plant fire protection program. The findings were also determined to be apparent violations and were assessed under the applicable significance determination process (SDP).

A regulatory conference was held with the Tennessee Valley Authority (TVA) on February 22, 2010. During the conference, TVA agreed that violations of NRC requirements occurred. TVA also stated the following: 1) their evaluation of the overall risk for the apparent violation involving Appendix R, Section III.G.2 is low to moderate (White); 2) the apparent violation involving Appendix R, Section III.G.1 should be combined with the Appendix R, Section III.G.2 apparent violation; 3) the cross-cutting aspect in the problem identification and resolution area for these first two apparent violations is a legacy issue and is no longer applicable; and 4) their evaluation of the overall risk for the third apparent violation involving a change to the safe shutdown instruction entry conditions is very low (Green). TVA committed to submit additional technical information to NRC for review. The results of NRC's review of the additional technical information and final significance determination are summarized below.

1. The licensee provided four major inputs to the NRC's preliminary SDP that indicated the safety significance of the Appendix R, Section III.G.2 apparent violation was in the White category. These inputs dealt with the following: a) the probability of entering the safe shutdown instructions (SSIs) in response to a fire; b) one of the SSI tasks originally identified by the NRC as critical was not critical to the success of the mitigation strategy; c) the Large Early Release Frequency associated with fires causing entrance into the SSIs; and d) conservatisms in the fire scenario development methodology. Each input is discussed below in more detail along with NRC's disposition of the input.
 - a. Probability of entering the SSIs in response to a fire

TVA Input - When the NRC performed the preliminary significance determination process (SDP), the full extent of damage caused by the postulated fires was not fully understood. Since preliminary SDP issuance, TVA gained a better understanding of the extent of damage from each postulated fire scenario. Using this information and information gathered through operator interviews, TVA determined which fires could result in entering an SSI. Also, based upon the damage state, a probability of SSI entrance was estimated. Draft NUREG 1921, "EPRI/NRC-RES Fire Human Reliability Analysis Guidelines," was used to establish this probability. Another human reliability method, SPAR-H, was also used to verify results.

NRC Response - In the final SDP, the NRC used the extent of damage provided by TVA in determining the probability of entering the SSIs. However, the criterion stated by TVA at the Regulatory Conference for entering the SSIs was not utilized. Instead, the NRC used criteria consistent with that stated in SSI-001, "Safe Shutdown Instructions," associated with multiple failures/spurious actuations or erratic/questionable indications or multiple safety related trains of equipment being threatened by the fire. These criteria ensured that the operators had a viable mitigation strategy when entering the SSIs prior to two trains being potentially affected, not after. As a result, the NRC identified a larger number of fires in which the probability that operators would enter the SSIs was 1.0.

The NRC recognized that judgment was involved in entering into the SSIs and considered that applying a probability to this decision is an assumption of the evaluation. The best available method for deriving the SSI entry probability was SPAR-H. Therefore, this was the method used. To understand whether additional insight could be gained, the methodology of the yet to be peer reviewed, draft NUREG 1921 was used. The results of this consideration did not provide any additional perspectives that supported TVA's safety significance of White.

b. Classification of one of the tasks; critical to non-critical

TVA Input - After the preliminary SDP was issued, one of the SSI tasks previously identified as critical to the mitigation strategy was identified as not critical. The task was to open breaker #710 on Battery Board 3. Sometime in the past, all load was removed from the breaker; consequently, leaving it closed would not overload Battery Board 3.

NRC Response - In the final SDP, the NRC re-classified this task as non-critical to the mitigation strategy. Any risk contribution associated with this task was eliminated.

c. Ramifications of Large Early Release Frequency on the safety significance

TVA Input - The large early release frequency associated with the postulated fires was not a magnitude greater than the core damage frequency contribution. NUREG/CR-6595, "An Approach for Estimating the Frequencies of Various Containment Failure Modes and Bypass Events," was used as the basis for assigning a Large Early Release Frequency to the damage state caused by each postulated fire coupled with the failure of a particular operator action assigned in an SSI.

NRC Response - In the final SDP the NRC agreed with TVA's conclusion and used the change in core damage frequency as the appropriate risk metric. This was determined through a review of the information TVA provided and an independent assessment of the damage states caused by each postulated fire coupled with the failure of a particular operator action.

d. Conservatism in fire development methodology

TVA Input - There were conservatisms associated the methods used in developing fires in terms of frequency of various types of fires, time to damage and extent of damage. These were qualitative in nature.

NRC Response - Consistent with NRC's policy, the best available information was used in the final SDP. This included recent Frequently Asked Questions from the NFPA 805 pilot program effort. Consequently, the SDP was not altered as a result of this input.

After integrating TVA's input into the final SDP, the risk characterization of the combined 10 CFR Part 50, Appendix R, Section III.G performance deficiency was Yellow, a finding of substantial safety significance, for all three units. The final delta core damage frequency was 1.4E-5 for Unit 1, 1.3E-5 for Unit 2, and 1.1E-5 for Unit 3.

2. The apparent violation involving Appendix R, Section III.G.1 should be combined with the apparent violation involving Appendix R, Section III.G.2.

TVA Input - The apparent violation involving 10 CFR Part 50, Appendix R, Section III.G.1 should be combined with the 10 CFR Part 50, Appendix R, Section III.G.2 apparent violation due to the same cause.

NRC Response - The NRC considered the discussion provided by the licensee and decided to combine these two apparent violations as one violation with two examples because they are related to the same performance deficiency. The significance of this apparent violation was combined with that of the 10 CFR Part 50, Appendix R, Section III.G.2 apparent violation, and is discussed in Item 1 above.

3. The cross-cutting aspect in the problem identification and resolution area for these first two apparent violations is a legacy issue and is no longer applicable.

TVA Input - The cross-cutting aspect in the problem identification and resolution (PI&R) area for the Appendix R, Section III.G.1 and III.G.2 apparent violations was a legacy issue that TVA had already adequately addressed and is no longer applicable. TVA's position was based on the following:

- TVA has taken corrective actions to address the substantive cross-cutting issue identified in the NRC 2007 Annual Assessment Letter dated March 3, 2008.
- The NRC concurred with the corrective action program improvements, as documented in NRC inspection report 2009002, dated April 30, 2009.
- NRC closed the substantive cross-cutting issue in the PI&R area on September 1, 2009.

NRC Response - The NRC considered the substantive cross-cutting issue previously identified in the PI&R area with a cross-cutting theme in the aspect of appropriate and timely corrective actions, (P.1(d)), to be a legacy issue for the violation example related to 10 CFR Part 50, Appendix R, Section III.G.2. The NRC's previous review of the corrective action program improvements and closure of this substantive cross-cutting issue is applicable to this violation example.

The NRC does not consider the P.1(c) cross-cutting aspect to be a legacy issue for the 10 CFR Part 50, Appendix R, Section III.G.1 violation example. The basis for this conclusion is TVA did not identify the mis-categorized Appendix R, Section III.G.1 fire areas when they submitted their request on January 27, 2009, to exempt Browns Ferry from the requirements of Appendix R, Section III.G.2. Additionally, TVA did not review these fire areas for compliance with Appendix R, Section III.G.1 until the NRC questioned the Appendix R, Section III.G.1 fire area designations during the NRC focused fire protection baseline inspection in April 2009 (Inspection Report 05000259, 260, 296/2009007 (ML091960199)).

The NRC considers this to be reflective of current licensee performance; therefore, the cross-cutting aspect for the 10 CFR Part 50, Appendix R, Section III.G.1 apparent violation example was appropriately characterized in NRC Inspection Report and Choice Letter 05000259, 260, 296/2009009. The cause of this violation example has a cross-cutting aspect in the Corrective Action Program component of the PI&R area, in that the licensee did not identify and thoroughly evaluate the problem, and the resolution did not address causes and extent of condition (P.1 (c)).

4. TVA's evaluation of the overall risk for the apparent violation involving a change to the safe shutdown instruction entry conditions is very low (Green).

The finding was determined to be an apparent violation associated with the requirements of Technical Specification 5.4.1.a. The finding was assessed under the significance determination process (SDP), using Appendix M, "Significance Determination Process Using Qualitative Criteria," as a preliminary White issue (i.e., an issue of low to moderate safety significance which may require additional NRC inspection).

TVA provided information which included the bases for their disagreement with the NRC's preliminary determination that the finding rises to a level of significance of a White finding. The licensee concluded that the risk associated with this condition was very low for all three Browns Ferry Units 1, 2 and 3, a finding of very low safety significance (i.e., Green). The specific technical issues are described below.

TVA Input - TVA concluded, based on qualitative methods, that the risk associated with the Technical Specification 5.4.1.a violation was "very low."

NRC Response - The NRC analysts reviewed the qualitative information that the licensee provided during and after the Regulatory Conference. The analysts considered the most severe postulated fire scenarios that the licensee called "Bin 1," where both TVA and the NRC agreed that safe shutdown would be challenged due to the cross-divisional effects of the fire. The licensee's qualitative evaluation assumed that the performance deficiency did not directly impact any defense-in-depth elements. However, the analysts noted that at least two layers of defense-in-depth would be affected (reactor vessel and containment) since "Bin 1" scenarios involved loss of all containment heat removal with at least one division of injection.

TVA Input - During the Regulatory Conference, TVA stated that additional walkdowns, fire modeling and discussions with operators were conducted following the on-site NRC inspections. Tennessee Valley Authority stated that this extra effort showed that additional equipment would be available during a postulated fire. The licensee concluded that, based on the additional equipment available, it was unlikely that operators would need to enter the SSIs for the identified scenarios, because reactor vessel water level would be maintained by available systems, including some not credited in the SSIs.

NRC Response - The NRC determined that no credit should be given for these additional water sources, for the following reasons: 1) most of the sources (high pressure coolant injection, reactor core isolation cooling, condensate system, and control rod drive injection water) were already accounted for in the initial NRC Appendix M approach, 2) two of the high pressure sources associated with the standby liquid control system (i.e., using the test

tank or with the boron injection tank) would provide negligible flow rates ~ 40 gpm, 3) several of the other sources of water (e.g., low pressure coolant injection and core spray) would only inject at low pressure and thus would be unable to inject during high pressure conditions, which were the sequences of concern to the analysts, and 4) two of the other high pressure sources (HPCI and RCIC using house steam) may not be able to be established in the time frame necessary to mitigate the consequences of the accident. Thus, the NRC concluded that no benefit should be granted for these water sources and that the risk modeling assumptions initially made during the analysis were correct.

TVA Input - During the Regulatory Conference, TVA stated that during a postulated fire there was a high likelihood that offsite power would remain available following a severely damaging fire. The licensee subsequently provided their analysis of condensate availability (associated with PER 177130). The licensee asserted that Table 2 of their O-SSI-001, "Safe Shutdown Instructions," was created assuming a conservative worst case fire coincident with a Loss of Offsite Power, and thus was not realistic.

NRC Response - The agency determined that loss of high pressure injection sources (HPCI and RCIC) in several fire zones was independent of a Loss of Offsite Power and is a valid risk assumption under all conditions. For reactor core cooling, the licensee credited the condensate system. However, in order to use the condensate system the reactor vessel needs to be depressurized (most likely using an emergency depressurization) which would create additional concerns with suppression pool conditions. Further, though the licensee's condensate/feed availability analysis was rigorous, the potential for a LOOP coincident with a fire was already accounted for in the re-analysis described in NRC Response #1 above. It was a risk based modeling assumption that no further credit should be given for the condition described by the licensee.

After considering the information provided by TVA during and after the conference, the NRC concluded that the risk significance of this finding regarding revision to the post-fire safe shutdown instruction entry conditions should be characterized as White, a finding of low to moderate safety significance.