



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

May 6, 2011

Mr. R. M. Krich  
Vice President, Nuclear Licensing  
Tennessee Valley Authority  
3R Lookout Place  
1101 Market Street  
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNIT 1, 2, AND 3 - REQUEST FOR  
ADDITIONAL INFORMATION REGARDING COMPLETION TIME EXTENSION  
FOR TS 3.8.1 REQUIRED ACTION B.4 - EMERGENCY DIESEL GENERATORS  
A, B, C, D, 3A, 3B, 3C, AND 3D (TAC NOS. ME5036, ME5037, AND ME5038)

Dear Mr. Krich:

By letter dated November 12, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML103210334), as supplemented on February 8, 2011 (ADAMS Accession No. ML110450256), Tennessee Valley Authority (the licensee) submitted a request for a Technical Specification change to extend the completion time for one diesel generator inoperable from 7 to 14 days.

Based on our review of your submittal and supplement, the U. S. Nuclear Regulatory Commission (NRC) staff finds that a response to the enclosed request for additional information is needed before we can complete the review. A draft of the enclosed questions was sent to the licensee on March 31, 2011.

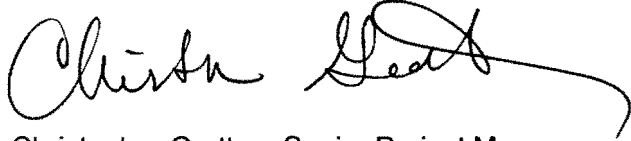
This request was discussed with Mr. Tom Mathews of your staff on April 27, 2011, and it was agreed that a response would be provided within 30 days from this date. During the call, the NRC staff identified an additional question regarding the manning of the temporary emergency diesels was not part of the March 31, 2011, draft. Question 2 has been modified to include a request for this additional information.

Mr. R. Krich

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If you have any questions, please contact me at (301) 415-1055.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Gratton", with a long, sweeping flourish extending to the right.

Christopher Gratton, Senior Project Manager  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-259, 50-260, and 50-296

Enclosure: Request for Additional Information

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION  
LICENSE AMENDMENT REQUEST FOR  
EXTENSION OF THE COMPLETION TIME FOR INOPERABLE DIESEL GENERATORS  
TENNESSEE VALLEY AUTHORITY  
BROWNS FERRY UNITS 1, 2, AND 3  
DOCKET NOS. 50-259, 50-260, 50-296

On January 19, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. 110140319), the Nuclear Regulatory Commission (NRC) staff requested additional information from Tennessee Valley Authority (TVA) regarding its November 12, 2010 (ADAMS) Accession No. ML103210334), amendment application. The following questions pertain to TVA's response dated February 8, 2011 (ADAMS Accession No. ML110450256).

**1. Staff question to TVA Response to Electrical Question 3a**

The licensee stated that "Achieving a cold shutdown condition during an SBO [station blackout] is not part of the plant's accepted SBO licensing basis. . .therefore the loads assigned to the TDGs [temporary diesel generators] are those needed to achieve HOT SHUTDOWN conditions."

The NRC staff is not evaluating the licensee's compliance with Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.63. The SBO analysis demonstrated the plant's capability to maintain HOT SHUTDOWN conditions for an extended duration.

The staff's objective of requiring an extra power source for an inoperable emergency diesel generator (EDG) is to avoid a potential prolonged SBO event during the period of extended allowed outage time (AOT). The staff has limited granting AOT extensions to those licensees who have installed a supplemental alternating current (AC) power source (i.e., additional diesels, gas turbines, or other power sources) that can be substituted for an inoperable EDG in the event of an extended loss-of-offsite power (LOOP). It is the staff's position that the supplemental AC source should have enough capacity to carry all LOOP loads to bring the unit to a cold shutdown and perform the EDG's original licensing basis functions on a multi-unit site. The supplemental AC source should be able to be manually aligned to the safety busses within one to two hours to replace the inoperable diesel generator and prevent SBO conditions for an extended duration. The SBO analysis may be used to provide assurance about the capability of the plant to maintain shutdown conditions during the time it takes to restore AC power from the supplemental source. While the supplemental AC source is intended to be used during a prolonged SBO event, it is not intended to maintain compliance with SBO licensing basis.

The staff considers it essential for the supplemental AC source to have adequate capacity to bring the plant to cold shutdown for the following reasons:

1. The design requirements of the onsite and offsite power sources ensure that the plant is capable of achieving cold shutdown following postulated accidents and anticipated operational occurrences. The supplemental AC source is needed to replace an existing

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source that has the capacity to support cold shutdown loads to maintain the defense-in-depth philosophy. An accident is not postulated.

2. Technical Specification (TS) 3.8.1.I requires the plant to be in cold shutdown if the limiting condition for operation is not met within the allotted time. In addition, TS 3.8.1.J requires entry into Limited Condition for Operation (LCO) 3.0.3 if a combination of onsite and offsite sources are not available. The supplemental source is expected to have adequate capacity to enable the plant to satisfy the requirements of LCO 3.0.3, if needed.
3. Other regulatory requirements, such as a responding to a serious fire, may require plant shutdown and transition to cold shutdown. The supplemental AC source should have adequate capacity to bring the plant to a cold shutdown as required by 10 CFR Part 50, Appendix R.

To maintain the defense-in-depth philosophy for the proposed plant configuration, provide details about the capability of the supplemental power source to bring the plant to a cold shutdown.

## **2. Staff question to TVA Response to Electrical Question 3b**

The licensee stated that TDG load testing will use a resistive load bank, and connection to a safety-related motor. The connection of a safety-related motor or other operable safety-related component to the nonsafety-related TDG(s) could cause the connected component, and any electrically interconnected components, to become inoperable, with respect to the TSs, during the test.

The NRC staff's expectation is that, as a minimum, the TDGs have a demonstrated capability for supplying large reactive power required during starting of the largest motor and steady state power requirements for expected loads to be connected to TDGs. The testing may be conducted at the TDG vendor/supplier's facility and the use of resistive load for demonstrating the kilowatt rating of the machine is acceptable. Please describe the planned method of verifying the reactive power capability of the proposed TDG.

In addition, please describe the operator manning requirements for the TDGs. Confirm that the TDGs will be continuously manned during any period that they are required to operate while an EDG is in extended period of AOT to ensure reliable operation and equal load sharing between the two TDGs, or provide a justification why continuous manning during operation is not required.

## **3. Staff question to TVA Response to Electrical Question 3c**

The licensee stated that during TDG load test, it will be ensured that the resistive load will be equally shared between the two TDGs.

The NRC staff is concerned about the resistive and reactive load sharing of the TDGs. The loads between the two TDGs will tend to become unequal (load drifting from one TDG to another TDG) due to any minor differences between the design and operating characteristics of the two TDGs. Provide details on the design features of the proposed TDGs that will ensure that the load sharing will be maintained in a balanced condition between the generators.

**4. Staff question to TVA Response to Supplementary Question 1 (See January 19, 2011, cover letter)**

The licensee has considered the potential unavailability of the TDG during the extended allowed outage time of an EDG under maintenance. The proposed TS allows 72 hours to restore an inoperable TDG from the point of discovery of an unavailable TDG if the unavailability was discovered after 4 days of continuous DG inoperability. In the event that the unavailability of the TDG was discovered on day 11 of the outage, there may be no incentive to restore the TDG.

The intent of extending the completion time for TS 3.8.1 is to accommodate preplanned maintenance activities for EDGs. The TDG is expected to be available at the beginning of the preplanned activity.

The NRC staff's position is that the TDGs must be available during the entire period of extended outage time, since availability of TDGs is a primary consideration for allowing extended outage time. Please revise the Required Action B.5 Completion Time for an unavailable TDG(s) based on above considerations.

Mr. R. Krich

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If you have any questions, please contact me at (301) 415-1055.

Sincerely,

*/RA/*

Christopher Gratton, Senior Project Manager  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-259, 50-260, and 50-296

Enclosure: Request for Additional Information

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ADAMS Accession No.: ML11118A154

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