



Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

December 23, 2014

10 CFR 50.4

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

Browns Ferry Nuclear Plant, Unit 1  
Renewed Facility Operating License No. DPR-33  
NRC Docket No. 50-259

Subject: **Browns Ferry Nuclear Plant (BFN) - Offsite Dose Calculation Manual (ODCM) Special Report**

The BFN ODCM, Controls and Surveillance Requirements, 1/2.2.2.4, "Gaseous Radwaste Treatment," requires that pursuant to ODCM Administrative Control 5.4, a Special Report is required within 30 days for gaseous radwaste being discharged without treatment for more than 7 days. The Unit 1 Offgas System gaseous radwaste charcoal adsorbers have been out of service (bypassed) since November 25, 2014, and the 7 day criteria for reporting was met on December 2, 2014.

The enclosed report provides details of the bypassed equipment and the reason the equipment was removed from service, the actions taken to restore the equipment to operation, and a summary description of the action(s) taken to prevent a recurrence. The investigation of this issue is currently in progress, and the cause analysis is expected to be finalized by January 15, 2015. If the results of the final analysis affect the content of the report, a supplement will be provided.

There are no new regulatory commitments contained in this letter. Should you have any questions concerning this submittal, please contact J. L. Paul, Nuclear Site Licensing Manager, at (256) 729-2636.

Respectfully,

K. J. Polson  
Site Vice President

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NRR

U.S. Nuclear Regulatory Commission  
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Enclosure: Special Report for the Bypass of the Gaseous Radwaste Offgas Charcoal  
Adsorbers

cc (w/ Enclosure):

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

**ENCLOSURE**

**Browns Ferry Nuclear Plant  
Unit 1**

**Special Report for the Bypass of the Gaseous Radwaste Offgas Charcoal Adsorbers**

**See Enclosed**

## ENCLOSURE

### Browns Ferry Nuclear Plant Unit 1

#### Special Report for the Bypass of the Gaseous Radwaste Offgas Charcoal Adsorbers

This enclosure provides details in accordance with Browns Ferry Nuclear Plant (BFN) - Offsite Dose Calculation Manual (ODCM) Administrative Control 5.4, "Special Reports," to discuss the gaseous radwaste being discharged without complete use of the BFN treatment equipment for more than 7 days (ODCM 1.2.2.4).

The Unit 1 Offgas System gaseous radwaste charcoal adsorbers have been out of service (bypassed) since November 25, 2014, and the 7 day criteria for reporting was met on December 2, 2014. This issue was entered into the corrective action program as Problem Evaluation Report (PER) 956279.

#### **Identification of the Bypassed Equipment and the Reason the Equipment was Removed from Service**

The Unit 1 Offgas System gaseous radwaste charcoal adsorbers are currently bypassed and removed from service. These adsorbers are normally operated in banks of three (1A-1C and 1D-1F) either in series or in parallel.

Upon startup from the Fall 2014 Unit 1 refueling outage in November 2014, temperatures in the 1A Offgas System gaseous radwaste charcoal adsorber were noted as increasing. The five other (1B-1F) charcoal adsorbers in the system did not experience this trend. The 1A trend continued until it was determined that a nitrogen purge was required to reduce temperatures (by oxygen reduction) and potentially help remove moisture. On November 8, 2014, the charcoal adsorbers were bypassed to allow nitrogen purging. On November 14, 2014, the system was returned to service, and temperatures remained stable for approximately 25 hours. On November 15, 2014, following a temperature increase, the system was bypassed again and nitrogen purging was resumed. Following approximately 5.5 days of nitrogen purging, the system was returned to service on November 22, 2014. The system operated as expected with normal temperatures until November 25, 2014, when the system was bypassed for a third time due to an increase in the 1A charcoal adsorber temperature.

#### **Actions Taken to Restore the Equipment to Operation**

The station continues to pursue additional means of removing moisture from the charcoal beds and/or restoring temperatures to expected levels for normal operation. Nitrogen purging continues while alternate methods are being studied. Releases are being monitored and are well within limits.

#### **Cause Of Charcoal Bed Elevated Temperature**

PER 956279 identifies the direct cause as hydrogen ignition upstream and/or in the charcoal adsorber beds. The hydrogen concentration increase was determined to be due to low hydrogen/oxygen catalytic recombiner temperatures, which was caused by high dilution steam flow from the Main Condenser Steam Jet Air Ejectors (SJAEs). The apparent cause of the high dilution steam flow is the system design - SJAЕ needle valve plugging.

## ENCLOSURE

### Browns Ferry Nuclear Plant Unit 1

#### Special Report for the Bypass of the Gaseous Radwaste Offgas Charcoal Adsorbers

Immediate and interim actions taken include

1. The isolation of the adsorber charcoal beds and use of a nitrogen purge to lower charcoal bed temperatures,
2. The placement of the SJAE Offgas discharge into bypass, where the gaseous radwaste bypasses the adsorber beds and goes directly to the elevated release (Offgas stack), and
3. The monitoring of Offgas stack release activity by Chemistry personnel.

#### **Summary Description of Action(s) Taken to Prevent a Recurrence**

Actions to prevent a recurrence of this condition have not been implemented. Based on the apparent cause that the plugged needle valve could not control the dilution steam flow from the SJAEs, the recurrence control action is to implement SJAE modifications to remove the needle valves and replace the steam pressure control valves and steam strainers. This action is currently scheduled to be completed by November 17, 2016, which is during the next Unit 1 refueling outage.