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

July 5, 2011

Ms. Leslie Monroe
1497 Old Town Loop Rd.
Oakland, OR 97462

SUBJECT: ISSUES RAISED REGARDING THE BROWNS FERRY NUCLEAR PLANT

Dear Ms. Monroe:

Enclosed please find written responses to your comments provided to the NRC regarding the Browns Ferry Nuclear Plant. You commented on the accuracy of documents submitted to the NRC by the Tennessee Valley Authority (TVA) and expressed some comments regarding the plant.

Regarding accuracy of information provided by TVA, information submitted to the NRC is required by regulation to be complete and accurate in all material respects. Information provided to the media by a licensee (such as TVA), and information reported by the media in regards to a licensee, is not formally reviewed by the NRC. However, information officially submitted to the NRC is reviewed for completeness and accuracy and, on occasion, has been found to be inaccurate. Any inaccurate information provided to the NRC is, in turn, identified to the licensee for correction, and evaluated to determine if it represents a violation of NRC requirements. Violations regarding accuracy of information have been issued to TVA, and documentation concerning our finding can be found in NRC Integrated Inspection Reports 2010003 (ML102110467) and 2010005 (ML110400431). To date, none of the information provided to the NRC regarding the severe weather near the Browns Ferry Nuclear Plant site has been found to be inaccurate or incomplete.

It should be noted that safety systems at a nuclear power plant are designed to safely shut down the reactor, keep the reactor shut down, and remove decay heat. These safety systems are designed to be redundant, so the necessary safety function can be accomplished with the failure of equipment. Although individual equipment failures did occur, the plant remained safely shut down following the severe weather that occurred on April 27, 2011. In that sense, it is reasonable to conclude that overall, the Browns Ferry Plant performed as designed.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Thank you for informing us of this matter. Should you have any questions, please call me at 1-800-577-8510 or you may provide information to me in writing at P.O. Box 56274 Atlanta, GA 30343.

Sincerely,

/Craig Kontz RA for/

Eugene F. Guthrie, Chief
Projects Branch 6
Division of Reactor Projects

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X PUBLICLY AVAILABLE ☐ NON-PUBLICLY AVAILABLE ☐ SENSITIVE X NON-SENSITIVE

ADAMS: ☐ Yes ACCESSION NUMBER:_____ML111861630_____ ☐ SUNSI REVIEW COMPLETE

OFFICE	RII:DRP	RII:DRP					
SIGNATURE	JDH /RA/	CRK /RA for/					
NAME	JHamman	EGuthrie					
DATE	07/05/2011	07/05/2011					
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: G:\DRPII\RPB6\BROWNS FERRY\LM_RESPONSE(CRK).DOCX

RESPONSE TO COMMENTS

Specific comments:

1. Only 12 of the required 100 off-site emergency sirens worked when the tornado hit.

   Response – Federal Regulations (10CFR50 Appendix E) require that each licensee demonstrate administrative and physical means have been established for alerting and providing prompt instructions to the public within the Emergency Planning Zone. The physical means established at the Browns Ferry Nuclear Plant are sirens and tone alert radios. The radios are placed in institutions where there are concentrations of people. There are also alternate means, such as patrol routes by local authorities that can be used in the event that sirens are not available. Prior to the severe weather event experienced on April 27, 2011, in the area of the Browns Ferry Nuclear Plant, the licensee was in compliance with the required number of operable off-site emergency sirens. The extensive damage to the regional power grid experienced during the weather event rendered sirens inoperable due to a loss of power. Alternate means of alerting the public were available had conditions at the plant reached the response level that would have required siren activation.

2. Two of eight emergency diesel generators were inoperable on April 27 and a third had to be shut down on April 28.

   Response – Each of the three reactor plants (or units) at the Browns Ferry site can be safely shut down with only one emergency diesel generator. However, at the Browns Ferry site, there are a total of eight diesel generators. Overall, given this additional capacity, the two diesels inoperable and the one that was shut down did not represent a challenge to the safe shutdown electrical power requirements of the plant. The NRC inspected each failure as part of the resident inspection follow-up.

3. On April 27, the Unit 3 “B” Main Steam isolation valve unexpectedly indicated “intermediate” – which may mean there was an electronic indicator problem, or the lack of Unit 3 “B” emergency diesel generator caused the problem, or it was an actual emergency cooling system valve malfunction (cited recently by the NRC with a red finding).

   Response – The “B” main steam isolation valve in question is one of two valves that isolate the main steam line in order to isolate reactor containment. Both valves are in the same pipe, with one valve located inside the containment structure and the other located outside of containment. The NRC staff confirmed that both valves actually closed, thereby performing their design function. An indication problem with one of the two valves resulted in the intermediate position indication. This indication problem was not related to any diesel generator failures and was not related to the recent red finding.

4. On April 28, an electrical part failure on Unit 1 initiated an automatic closure of shutdown cooling emergency valves. Power was restored after 47 minutes.

Response – The loss of shutdown cooling was a result of a sequence of events that followed discovery of an oil leak on an emergency diesel generator and was not a result of the severe weather at the site. The generator was shut down due to the oil leak, and, as a result, loss of power caused system isolation which resulted in an interruption of shutdown cooling. Shutdown cooling was restored by repositioning valves, transferring power to an alternate supply, and then restarting the cooling pump. The loss of cooling was brief and the plant remained well within temperature limits. The resident inspectors verified that TVA inspected all other diesel generator to ensure that those generators did not have any similar oil leaks.

5. On May 2, Unit 1 received an "A" emergency generator output breaker trip for unknown reasons, resulting in a loss of shutdown cooling. Power was restored after 57 minutes.

   Response - The loss of shutdown cooling was a result of a sequence of events that followed the failure of a mechanical trip linkage on an emergency diesel generator and was not a result of the severe weather at the site. The resulting loss of power caused system isolations which resulted in an interruption of shutdown cooling. Shutdown cooling was restored by repositioning valves, transferring power to an alternate supply, and then restarting the cooling pump. The loss of cooling was brief and the plant remained well within temperature limits. The resident inspectors verified that TVA inspected all other diesel generators to ensure that those generators did not have any similar problems with mechanical linkages.

6. What if the sole 161 KV Athens incoming power line had not survived the tornado?

   If the 161 Athens line had not survived the tornado the plant would have had adequate emergency electrical capacity from the diesel generators on site. The plant is designed to withstand this condition.

7. What if a Browns Ferry cooling pool (with only its sheet metal roof) had sustained a direct hit from that powerful tornado and water had been sucked out of a cooling pool?

   Response – Fuel rods that have been removed from the Browns Ferry Nuclear Plant reactor are stored in spent fuel pools that are built into the plant structure. The structure around the pool is designed to withstand high winds from tornados. The water in the pool is greater than 20 feet deep in order to provide shielding and cooling to the spent fuel. The reactor building structure includes panels used to equalize pressure between the refueling room and the atmosphere. These features, along with the length and weight of the fuel rods, ensures that the fuel will remain in the pool during a tornado. Additionally, due to the ability of the pool walls to block winds that could entrain water and the non-stationary behavior of tornadoes, loss of significant pool water level due to the tornado effects is not likely (i.e., no more than a few feet of the water could be lost to a direct strike by even the most powerful tornado). Some damage may occur to the building peripheral structures; however, the integrity of the fuel pool is designed to be maintained. Additionally, water can be added to the spent fuel pools through several redundant means. These include the normal supply from the condensate storage system and backup supply from the emergency equipment cooling water system and manual fire hose connections. The spent fuel pools are analyzed in the plant's Final

Safety Analysis Report and fuel pool operation is monitored via routine plant inspections by the NRC resident inspectors.

8. After Fukushima, an EF-5 tornado sweeping so close to three reactors at Browns Ferry, and the 2006 National Academy of sciences study commissioned by the NRC and homeland security, how many warnings do we need before we remove such spent fuel as far as possible from vulnerable cooling pools and into more secure dry cask storage?

   Response – As discussed above, the Browns Ferry Nuclear Plant and its associated spent fuel pools are designed to withstand high winds from tornados. Additionally, the Browns Ferry Nuclear plant does use dry cask storage licensed by the NRC. BFN, as well as other nuclear utilities, have programs in place to move a portion of the spent fuel from the pools to the dry casks. When, and how much, fuel is moved depends on factors such as available space in the spent fuel pool and decay heat output of the spent fuel. The dry cask storage programs are routinely inspected by the NRC resident inspectors as well as regional inspectors.