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Project Name: WBN Unit 2 Steam Generator  
Replacement  
Project Number: 2017-16

**FINDING OF NO SIGNIFICANT IMPACT**  
**TENNESSEE VALLEY AUTHORITY**  
WATTS BAR NUCLEAR PLANT UNIT 2  
REPLACEMENT OF STEAM GENERATORS  
RHEA COUNTY, TENNESSEE

The Tennessee Valley Authority (TVA) proposes to replace the four steam generators in Unit 2 at the Watts Bar Nuclear Plant (WBN). The subject steam generators use pressurized hot water from the reactor to generate steam for propelling the turbines used to produce electric power. Over time, tubes within the steam generators can degrade, leading to decreased power generation efficiency. Replacement of the Unit 2 steam generators would allow TVA to operate WBN more efficiently and maintain generating capacity of Unit 2.

**Alternatives**

In accordance with the National Environmental Policy Act (NEPA), TVA developed and evaluated two feasible alternatives in the Environmental Assessment (EA), the No Action Alternative (Alternative A) and the Action Alternative (Alternative B). The EA is incorporated herein by reference.

Under Alternative A - the No Action Alternative, TVA would continue to operate Unit 2 at WBN without replacing the original steam generators (OSGs). This would result in gradual derating (reduction of power generation) of WBN Unit 2 followed by subsequent shutdown of the unit or large expenditures of resources for repair of the degraded steam generator tubes. When the power level could no longer be maintained, additional power would need to be made up to support the Tennessee Valley's power needs. At some point, the economic viability of the unit would be threatened.

Under Alternative B, TVA proposes to accept delivery of the replacement steam generators (RSGs) at WBN in fall 2018 and replace the four Unit 2 steam generators during a scheduled outage between 2018 and 2024. The date of the replacement would be determined based on the findings of inspections conducted in accordance with NRC requirements during each refueling outage (which occur every 18 months). The steam generator replacement would occur during the following outage where an inspection indicates the tubes are becoming 15 percent clogged.

The replacement of the four steam generators would occur in two phases. Phase I would occur in 2018, when the four RSGs would be delivered by barge to WBN and stored in a temporary structure until installation. Phase I would also include construction of a permanent storage building for the Unit 2 OSGs immediately adjacent to the existing Unit 1 OSG Storage Facility (OSGSF).

The commencement of Phase II would be determined by the status of the tubes as described above. During Phase II, two lift cranes (one large and one medium sized) would be placed on crane mats or poured concrete pads adjacent to the Unit 2 containment building. Two openings would be

made in the Unit 2 reactor containment dome and four openings in the interior concrete shell and steel containment structures using a hydrodemolition process (a high-pressure water stream over a multiple day period), torch, and diamond wire. Each of the four OSGs would be cut free from existing piping and lifted by crane to the self-propelled modular transporter and transported to the new storage building. The RSGs would be transported along the same route to the containment building. The crane would then lift the RSGs into the containment building where they would be connected to the existing piping. The removed portions of the concrete dome would be replaced with new concrete and rebar. The temporary openings in the containment building would be reclosed using the refurbished steel and concrete cutouts. The old concrete would be stored near the OSGSF or crushed and transported for disposal at a permitted landfill.

The construction of the OSGSF would last approximately 7-10 months and would begin no earlier than spring 2018. Installation of the RSGs would occur at the next refueling cycle after the inspection deemed replacement would be necessary. There are 18 months between refueling campaigns. Removal of the OSGs, installation of the RSGs, and repairs to the containment building would take approximately 2.5 months during a scheduled plant outage.

### **Impact Assessment**

During preliminary review TVA determined that the proposed actions would have no impacts to wildlife, vegetation, aquatic ecology, threatened and endangered species, wetlands, and natural areas. These resource areas were not evaluated in detail in this EA. After further review TVA also determined there would be no impacts to climate change, floodplains and flood risk, and cultural and historic resources.

TVA determined there would be minor and temporary adverse impacts associated with hazardous materials and solid and hazardous waste, surface water, navigation/transportation, land use and visual resources, noise, and socioeconomics and environmental justice. Surface water and hazardous materials and solid and hazardous waste impacts would be minor because TVA would comply with applicable local, state, and federal requirements as well as implement best management practices. Minor impacts to navigation/transportation would be minimized through the implementation of best management practices and coordination with TVA's River Scheduling staff. Land use and visual resource impacts would be minor and would be consistent with the existing land use and visual appearance of WBN. Due to the short term of the project, the impact on socioeconomics in Rhea County would be minor.

Additionally, TVA determined there would be minor impacts associated with occupational radiation doses and radioactive/mixed waste. These impacts would be mitigated through use of best management practices and implementation of worker safety regulations in compliance with all federal, state, and local regulations.

There would be beneficial impacts associated with air quality in conjunction with the proposed action as a result of the continued operation of WBN Unit 2 in lieu of an alternative generating plant.

TVA has determined that incremental cumulative impacts of purchasing, transporting, and installing four RSGs for Unit 2 at WBN and onsite interim storage of the OSGs would be minor.

## Mitigation

To minimize or reduce the environmental effects of the project, TVA would utilize standard operating procedures, best management practices, and mitigation measures as described below.

Standard Operating Procedures/Best Management Practices (BMPs) include:

- The primary fuel for the equipment and vehicles would be low-sulfur diesel fuel.
- Appropriate BMPs would be implemented to control and reduce fugitive dust emission from steam generator replacement (SGR) construction activities.
- All wastes would be managed in accordance with existing WBN waste management procedures and general BMPs.
- Any radioactive SGR construction wastes would be managed by TVA in accordance with 10 Code of Federal Regulations (CFR) Part 100 limits and WBN's implementing procedures.
- TVA would coordinate with River Scheduling to ensure that Tennessee River flows would be kept as steady as possible during the delivery operations of the RSGs.
- All excavation would be performed in accordance with digging permits, TVA-TSP-18.804, TVA Safety Manual Form 29205, and appropriate BMPs.
- If 1 acre or more of land were to be disturbed in a given drainage area during construction, a Construction Storm Water Permit would be obtained.
- For excavation and grading within 60 feet of the normal Chickamauga Reservoir high water mark, an Aquatic Resource Alteration Permit (ARAP) permit would be obtained.
- Storm water runoff from all areas disturbed during the SGR work (i.e., RSG off-loading area, OSGSF areas, temporary construction laydown and parking, etc.) would be protected through the use of erosion and sediment control BMPs as defined in the WBN ECM-4, 4.0 Best Management Practices (TVA 2004c), SPCC Plan ECM-8 (TVA 2004e), and TVA's Corrective Action procedure (NPG-SPP-22.300, Corrective Action Program).
- The source water for hydrodemolition activities for the Unit 2 containment dome would be the existing fire protection system for WBN. This water would be filtered and discharged through Outfall 101. Compliance with the National Pollutant Discharge Elimination System (NPDES) discharge limitations for this outfall would be maintained.
- Prior to hydrodemolition, TVA personnel would coordinate with Tennessee Department of Environment and Conservation (TDEC), Water Division, the proper method for sampling, treating, and releasing this process water.
- WBN's Storm Water Pollution Prevention Plan and/or Integrated Pollution Prevention Plan (IPPP) would be modified to include the new steam generator laydown and other areas affected by the project. TVA would notify the State of Tennessee of the change and coordinate any updates to the site's coverage under the Tennessee Storm Water Multi-Sector General Permit for Industrial Activities as needed.
- A member of TVA's Navigation staff would assist in communication with the locks and the tows while the RSGs were enroute to WBN.

- Hydroexcavation slurry would be transported and placed at the WBN spoils area with geotextile fabric and/or hay bales, silt fences, and straw wattles for filtration

In addition to the standard operating procedures and best management practices described above, TVA would implement the following non-standard, project specific mitigation measures:

- TVA would implement (as necessary) a public noise awareness program prior to the start of the SGR work.

### **Conclusion and Findings**

Based on the findings of the EA, TVA concludes that the proposal to remove four OSGs, transport and install four RSGs, and provide permanent onsite storage for the OSGs at WBN Unit 2 would not be a major federal action significantly affecting the environment. Accordingly, an environmental impact statement is not required.



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Date Signed