Document Type: EA-Administrative Records
Index Field: Finding of No Significant Impact
Project Name: Watts Bar Nuclear Plant Unit 1 Replacement of Steam Generators
Project Number: 2003-6

FINDING OF NO SIGNIFICANT IMPACT
TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT UNIT 1 REPLACEMENT OF STEAM GENERATORS

Proposed Action and Need

Tennessee Valley Authority (TVA) has prepared an Environmental Assessment (EA) to determine whether to replace four steam generators at Watts Bar Nuclear Plant (WBN) Unit 1. Steam generators, like any other heat exchanger or large piece of equipment, wear or degrade (reducing power) with usage. The United States Nuclear Regulatory Commission requires that extensive eddy current testing be done periodically during each refueling outage to ensure the integrity of the steam generator tubes, which form a critical part of the reactor coolant system pressure boundary. Tubes found degraded must be plugged or otherwise repaired. These repairs reduce the heat transfer surface area and ultimately restrict the steam pressure to the turbine generator, thus reducing the generator's ability to produce power. The refueling outage testing indicates there is a high probability the unit would have to derate starting at the time of Unit 1 Cycle 7 refueling outage scheduled for September 2006. This degradation and resultant repair would increase with time leading to larger losses of generation and lost revenue to TVA. Ultimately, this could lead to the shutdown of the unit. Replacement of the steam generators would maintain the generation capability of WBN Unit 1. TVA proposes to implement Alternative B as described and evaluated in the EA.

Alternatives

There are two alternatives discussed and evaluated in the EA: (1) the No Action Alternative (Alternative A) and (2) the Action Alternative: to purchase, transport, and install four replacement Unit 1 steam generators at WBN and provide on-site interim storage for the removed steam generators (Alternative B).

Under Alternative A, if the steam generators were not replaced, additional radiation exposures would continue to be amassed by workers who perform the required testing, maintenance, and repair to maintain unit operability at its expected power level. The radiation exposure level would increase with time as the frequency of the work to repair tubes increased. When the power level could no longer be maintained, additional power would need to be made up to support the Valley's power needs. At some point, the economic viability of the unit would be threatened.

Under Alternative B, TVA would purchase replacement steam generators (RSGs), accept delivery to WBN in fall 2005, and install these steam generators during the Unit 1 Cycle 7 refueling outage in fall 2006. Replacement of the four steam generators would be considered a large maintenance project. The general activities involved would include the following:

- Clearing, grading, excavation, and stabilization work
- Delivery of permanent plant equipment (e.g., RSGs) and temporary storage on concrete saddles

- Delivery of construction equipment and materials (e.g., trucks, compressors, cranes, pipe, steel plating, concrete)
- Reclamation of two former parking lots and one former laydown area
- Construction of a new building (i.e., old steam generator storage facility [OSGSF]) on site for storage of the old steam generators (OSGs)
- Construction of a new decontamination building
- Excavation and foundation work for the outside lift system crane and erection of the crane adjacent to the Unit 1 containment building
- Excavation and foundation work for the off-load crane at the barge off-load area
- Excavation work for construction of the pedestrian footbridge in a wooded area near the parking lot immediately west of the heavy equipment building
- Demolition activities on the Unit 1 containment dome for access and removal of the existing steam generators
- Removal of waste concrete and steel
- Removal of OSGs and associated piping
- Installation of RSGs and associated piping in Unit 1
- Replacement of steel and concrete shielding on the Unit 1 containment dome

TVA's preferred alternative is Alternative B: to purchase, transport, and install four replacement Unit 1 steam generators at WBN and to remove and provide on-site interim storage for the OSGs. This option maintains unit operability at its expected power level and is the most economically feasible alternative.

Impacts Assessment

A TVA interdisciplinary team reviewed the proposed project for potential direct, indirect, and cumulative effects as a result of continuing to operate Unit 1 at WBN without replacing the steam generators (No Action Alternative), and purchasing, transporting, and installing four replacement Unit 1 steam generators at WBN along with removing and on-site interimly storing the OSGs (Alternative B). Due to the location and nature of the activities, there would be no potential impacts under either alternative on groundwater, recreation, managed areas, prime farmland, or unique natural features. The potential impacts for wetlands, archaeological and cultural resources, socioeconomics and environmental justice, and land use and visual resources would be minor and insignificant.

As previously stated, under Alternative B, TVA would purchase RSGs, accept delivery to WBN in fall 2005, and install these steam generators during the Unit 1 Cycle 7 refueling outage in fall 2006. Further, TVA would store the removed steam generators on-site on an interim basis. TVA evaluated these activities for potential environmental effects. For the media areas that had potential effects, mitigation commitments were put into place to ensure the environmental effects would be insignificant.

Under Alternative B, there would be the potential for:

- Surface water, air quality, aquatic ecology, terrestrial ecology, solid and hazardous waste, occupational radiation doses and radioactive waste, noise, and floodplains and flood risk impacts from construction and steam generator replacement activities.

- Beneficial air emission as compared to replacement energy.

- Navigation issues from transporting the RSGs to WBN.

With the commitments identified below (see Mitigation), impacts to air quality, surface water, aquatic ecology, terrestrial ecology, solid and hazardous waste, occupational radiation doses and radioactive waste, noise, floodplains and flood risk, and navigation would be insignificant.

Mitigation

The following environmental commitments for Alternative B, the proposed action, were identified as necessary to ensure that environmental impacts are insignificant.

Routine and Compliance Measures

(1) The primary fuel for the equipment and vehicles will be low-sulfur diesel fuel.

(2) Appropriate best management practices (BMPs) will be implemented to control and reduce fugitive dust emission from replacement activities and parking lot excavations.

(3) All wastes will be managed in accordance with existing WBN waste management procedures and general BMPs.

(4) Because the proposed footbridge construction involves modification of the stream bank, albeit minor, an Aquatic Resource Alteration Permit will be needed for this action.

(5) Water flow and stream bank disturbance during footbridge construction and dead tree removal will utilize specific BMPs to avoid direct impacts to the stream channel and connected wetlands.

(6) For footbridge construction, soil disturbance will be minimized and silt fencing will be placed around the excavation area and along the edge of the stream channel to control sediment from entering the drainage area.

(7) Soil removed during construction of the footbridge will be scattered around in the footbridge area outside the stream channel and stabilized with gravel.

(8) Silt fencing and hay bales will be placed around the barge off-load excavation areas to ensure no sediments enter the Tennessee River.

(9) TVA will coordinate with River Scheduling to ensure that flows and depths of approximately 16 feet will be kept as steady as possible during the delivery operations of the RSGs.

(10) The temporary sand box to the west of the crane pad will be in place for up to 6 months. After this time frame, the sand box will be removed, and the area will be returned to preconstruction conditions.

(11) All excavation will be performed using digging permits, WBN TI-215, and appropriate BMPs.

(12) If 1 acre or more of land is to be disturbed in a given drainage area during construction, a Construction Storm Water Permit will be obtained.

(13) Storm water runoff from all areas disturbed during the steam generator replacement work (i.e., RSG off-loading area, OSGSF building areas, decontamination building area, temporary construction laydown and parking, and pedestrian site access bridge) will be protected through the use of erosion and sediment control BMPs as defined in the WBN Environmental Compliance Manual (ECM)-4 (4.0 Best Management Practices), Spill Prevention Control and Countermeasure (SPCC) Plan ECM-8, and Standard Programs and Processes-3.1, Corrective Action Program.

(14) After the steam generator replacement work has been completed, the embedded foundations will be covered with original roadway gravel surface material, and the barge off-loading area will be returned to the original configuration.

(15) The source water for both hydrodemolition and hydroexcavation activities will be the existing fire protection system for WBN. This water will be discharged through Outfall 101. Compliance with the National Pollutant Discharge Elimination System discharge limitations for this outfall will be maintained.

(16) Prior to hydrodemolition, WBN environmental personnel will coordinate with Tennessee Department of Environment and Conservation (TDEC), Water Division, the proper method for sampling, treating, and releasing this process water.

(17) Hydroexcavation slurry will be transported and placed at an on-site spoils area with geotextile fabric and/or hay bales, silt fences, and straw wattles for filtration.

(18) Extra protection will be afforded through designating a spoils area with appropriate BMPs ensuring no runoff from this area reaches waters of the U.S.

(19) The Tennessee Storm Water Multi-Sector General Permit for Industrial Activities will be modified to include the new laydown and reclaimed parking lot areas.

(20) Steam generator replacement work will be conducted in accordance with the existing WBN SPCC Plan and Corrective Action Program.

(21) A member of TVA's Navigation staff will assist in communication with the locks and the tows while the RSGs are en route to WBN.

Special Mitigation Measures

(1) The dead tree in the proposed footpath area will be removed in the dormant season between October 31 and April 1 in accordance with guidelines specified in the Indiana Bat Recovery Plan.

(2) TVA will implement (as necessary) a public noise awareness program prior to the start of the steam generator replacement work.

Public and Intergovernmental Review

Copies of the draft document were provided to TDEC, Tennessee Wildlife Resources Agency, and United States Fish and Wildlife Service (USFWS) January 2005 for intergovernmental review. A 30-day public comment period occurred January-February 2005.

Conclusion and Findings

Environmental Policy and Planning's National Environmental Policy Act (NEPA) Administration staff reviewed the Watts Bar Nuclear Plant Unit 1 Replacement of Steam Generators EA. The staff determined that the potential environmental consequences of Alternative B (purchase, transport, and install four replacement Unit 1 steam generators at WBN and on-site interim storage of the removed steam generators) have been adequately addressed. Further, the USFWS concurs that the proposed replacement of the steam generators (Alternative B) is not likely to affect federally listed threatened or endangered species adversely. Therefore, Alternative B is not a major Federal action significantly affecting the quality of the environment, and an Environmental Impact Statement is not required.

Original signed by April 7, 2005

Jon M. Loney, Manager
NEPA Administration
Environmental Policy and Planning
Tennessee Valley Authority

Date Signed