Sequoyah Nuclear Plant, Unit 2

Steam Generator Replacement Project Status and Licensing Plan

January 26, 2011

Introduction

- Purpose
- Background
- Replacement Steam Generator (RSG) Design Features and Installation Overview
- Project Status
- Licensing Plan
- Summary

Purpose

- Provide background information, RSG design and installation overview, and describe the overall licensing process that TVA will use
- Provide the NRC staff TVA's current project status and licensing plan for the Sequoyah Unit 2 (SQN 2) Steam Generator (SG) replacement
- Describe the submittals that TVA expects to provide to the NRC

Background

- The SQN 1 steam generators were replaced in 2003
- The Watts Bar Unit 1 (WBN 1) steam generators were replaced in 2006
- The contract for SQN 2 steam generator removal and installation was awarded in 2009 to the Steam Generating Team (SGT)
- The methodology for replacement is virtually the same as SQN 1 and WBN 1

Background (continued)

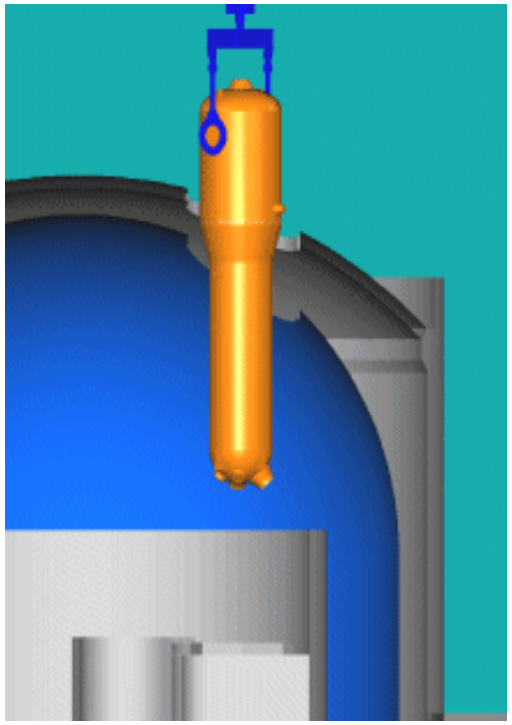
- The SQN 2 replacement steam generators are like-for-like compared to the original steam generators in form, fit, and function (same as SQN 1)
- Shield Building, Steel Containment Vessel (SCV) and SG Compartment Modifications use the same methodology as SQN 1

RSG Design Features

- Steam Generators were designed by Westinghouse, fabricated by Doosan, and SG tubes provided by Sandvik
  - Same physical size as existing steam generators
  - Increased tube surface area to provide additional plugging margin
  - Integral loose parts strainer provided for FW/AFW
  - Reduced moisture content at steam nozzle exit
  - Additional access hand holes for maintenance
  - Snaplock Nozzle Dams provided for dose reduction
  - Electro Polished Head Bowls for dose reduction

RSG Installation Overview

- One Piece Replacement like SQN 1
- Major Activities Involve:
  - Defuel Reactor
  - Cut holes in Shield Building dome, SCV, and SG Compartment Roofs
  - Remove existing SGs
  - Install Replacement SGs
  - Restore SG Compartments, RCS piping, SCV, and Shield Building dome
  - Refuel Reactor
  - Pressure Test to Demonstrate Restored Containment Integrity



Project Status

- The SQN 2 steam generators are to be replaced in the Cycle 18 (U2C18) Refueling Outage, scheduled to start October 21, 2012
- RSGs are on site (controlled storage)
- Engineering and planning for U2R17 work progressing on schedule
- Engineering, licensing, and installation planning for U2R18 progressing on schedule
- AREVA Accident Analyses review complete
  - No new analysis required for the Unit 2 RSGs
  - Currently reconciling existing calculations and analysis by mid summer 2011

Project Status (continued)

- Safe Load Paths and Drop Analysis for Crane Components, Steam Generators, and Other Heavy Loads under Development
- Licensing Submittals being prepared

Licensing Plan

- Steam Generator Component Replacement Performed via 10 CFR 50.59
- Design Changes Related to RSGs Performed via 10 CFR 50.59

Licensing Plan (continued)

- License Amendment Requests (LARs)
  - LAR (UFSAR 3.8.3.4.8) to address the Code change used in restoration of the concrete roof of the steam generator compartments
  - LAR (UFSAR 3.8.1) to use Bar-Lock Mechanical Couplers instead of Cadwelds for Rebar Splicing during Shield Building Dome Restoration
  - LAR to revise Steam Generator Inspections (TSTF-449)

Licensing Plan (continued)

- Relief Request
  - Relief request to utilize a containment pressure test in lieu of a Containment Integrated Leak Rate Test for Post Modification Testing of restored Steel Containment Vessel
- One Time Use LARs
  - One time use LAR (License Condition) for movement of loads over Essential Raw Cooling Water piping per GL 96-02
  - One time use LAR for two 18” hatches in the shield building dome to allow pre-outage work in the annulus space during power

Licensing Plan (continued)

- Request for use of 18” hatches at power will facilitate pre-outage work in the annulus space
  - Will use alternate source terms
  - This is a one time change with defined times of use, limits on use, compensatory measures while in this condition, and defined expiration date

Licensing Plan (continued)

- Submittal Schedule
  - Relief Request for containment pressure test submitted December 22, 2010 – approval requested by October 1, 2012
  - One time use LAR for two 18” hatches to be submitted by May 1, 2011 – approval requested by July 1, 2012
  - Three LARs to be submitted by May 1, 2011 – approval requested by October 1, 2012
  - One time use LAR for movement of loads to be submitted by July 1, 2011 – approval requested by October 1, 2012

Summary

- Implementing SQN/WBN Lessons Learned and Best Practices
- Based on SQN 1 Licensing/Design Basis similarities
- Plan is to provide at least 1 year NRC review time