Main Generator Rotor Replacement

Stephen Dallas, Principal Engineer
March 23, 2010
Project Scope

- Ship New Rotor from Charlotte, NC to Columbia
- Move Rotor to Turbine Deck
- Dismantle Generator and Remove Existing Rotor
- Perform 8 Year Inspection of Generator
- Install New Rotor
- Move Existing Rotor to Storage Container and Store Onsite
Industry Perspective

- Many other Westinghouse Generator Owners have already Replaced their Generator Rotor (STP, Cooper, Farley….)
- Others have Ordered New Rotors for Future Replacement (Sequoya, Turkey Point, St Lucie, Byron, Braidwood….)
- Rotor Shorted Turns are a Common Occurrence on Generators, some can be Rewound in the Field while others Require Rotor Replacement
Rotor Shorted Turns

- Rotors Consist of a Single Winding of 200 Turns
- Each Turn is Insulated from other Turns and from the Rotor Body
- When the Insulation between Turns Degrades Shorting can Occur Effectively Eliminating 1 Turn
- This Condition Requires Additional Field Current to Maintain Magnetic Flux Density
- This Additional Field Current Results in Increased Heating which Stresses Remaining Insulation
- Shorted Turns also Result in Imbalance which can cause Excessive Vibrations Damaging other Components
Budget

- Budget is in Place for FY 2011, $6 Million for New Rotor
- Rotor Out Inspection is Scheduled for FY 2011, Budget of $3.5 Million in place to Disassemble and Reassemble Generator
Status/Issues

- The New Rotor is ready to be Shipped when needed
- Work Scheduled and Budgeted for R-20
- Torsional Testing Scheduled for Startup
Miscellaneous Pictures