



TENNESSEE VALLEY AUTHORITY BROWNS FERRY NUCLEAR PLANT

Meeting with NRC

Extended Power Uprate and Transition to NFPA 805 Update

Rockville, Maryland

September 15, 2011

Agenda



- Introductions
- Background
- Containment Accident Pressure
- Replacement Steam Dryers
- Submittal and Review Schedule
- NFPA 805 Transition Status

Background



- Browns Ferry Nuclear (BFN) Extended Power Uprate (EPU) application currently under NRC review for all three units will result in 14.3 percent increase above current licensed power.
- In September 2009, the NRC placed the application review on hold pending development of guidance on credit for Containment Accident Pressure (CAP). Two outstanding issues for the BFN EPU remained to be resolved:
 - CAP
 - Steam dryers
- TVA met with NRC on December 15, 2010 to:
 - Confirm outstanding project scope
 - Communicate planned CAP mitigation strategy relative to draft NRC guidelines
 - Communicate plans for steam dryers

Background *(continued)*



- NRC guidance associated with CAP:
 - In January 2011, NRC Staff requested approval to resume review of EPU license amendment requests (LARs) using the revised CAP guidance.
 - In March 2011, the Commissioners issued a memorandum that approved the revised CAP guidance provided by the Staff and allowed work on EPU LARs to resume.
- Based on issuance of NRC guidance on CAP, TVA determined that submittal of key assumptions (as discussed in December 15, 2010 meeting) was not necessary.
- On May 15, 2011, the NRC issued a letter to TVA stating that, based on development of CAP review criteria, the NRC is prepared to resume review of the BFN EPU application.

Containment Accident Pressure



- TVA identified and evaluated changes/modifications to eliminate or minimize CAP credit for limiting events, using NRC CAP guidance.
- At this time, using NPSHr (net positive suction head required) 3 percent curves eliminates CAP credit for the station blackout (SBO) and anticipated transient without scram (ATWS) events.
- The following actions are planned to eliminate CAP credit for fire events:
 - TVA plans to revise the Generic Letter 89-13 heat exchanger analysis and program to support taking credit for improved residual heat removal (RHR) heat exchanger performance.
 - TVA plans to increase suppression pool inventory using Condensate Storage Tank water.
 - Increased suppression pool water inventory combined with improved RHR heat exchanger performance reduces peak suppression pool temperature, increases RHR pump static head, and eliminates CAP credit.

Containment Accident Pressure *(continued)*



- NRC CAP credit guidance introduced an uncertainty adder to NPSHr for a design basis loss-of-coolant accident (LOCA) event. The Boiling Water Reactor Owners Group (BWROG) has been developing a generic approach for addressing the NPSH uncertainty adder.
- TVA plans to use the BWROG approach.
- Improving RHR heat exchanger performance eliminates CAP credit for the long-term (i.e., >10 minutes) LOCA event.
- TVA plans to take CAP credit only for the short-term (i.e., <10 minutes) LOCA event in accordance with the NRC guidance.
- TVA will request formal NRC acceptance of the analysis for CAP credit for short-term LOCA.

Containment Accident Pressure *(continued)*



The following summarizes the CAP credit approach for the BFN EPU application:

Event	Current Need	Approach
Short-term LOCA (< 10 minutes)	Need CAP credit for RHR and Core Spray due to run-out flow rate and suction strainer loading	Request formal NRC acceptance of CAP credit
Long-term LOCA (> 10 minutes)	Need small amount of CAP credit for Core Spray	Eliminate CAP by improving RHR heat exchanger performance
Fire Protection	Need large amount of CAP credit for RHR	Eliminate CAP by improving RHR heat exchanger performance and increasing suppression pool inventory
SBO	CAP credit not required	CAP credit not required
ATWS	CAP credit not required	CAP credit not required

Replacement Steam Dryers



- In December 2009, TVA determined that NRC concerns with analyses of existing steam dryers could not be resolved, and replacement steam dryers (RSDs) would be required.
- An RSD specification was developed and provided to prospective vendors. The RSD work scope consists of three phases:
 - Phase I, Design and Analysis
 - Phase II, Fabrication
 - Phase III, Installation
- Negotiations are in progress with General Electric Hitachi for RSD design, analysis, fabrication, and installation.

Submittal and Review Schedule



- The proposed EPU schedule is based on overall resource and risk considerations for TVA.
- The EPU schedule assumes the following:
 - RSD analysis and design will not begin until the formal acceptance of the CAP analysis by the NRC.
 - RSD fabrication will not begin until NRC issues the EPU amendment.

Submittal and Review Schedule *(continued)*



TVA Submittals

- EPU CAP Analysis Report May 2012
 - Schedule assumes BWROG input is received in March 2012
 - TVA will request NRC formal acceptance of CAP Analysis Report

- EPU Steam Dryer Analysis Report Spring 2014

NRC Review Expectations

- Acceptance of CAP Analysis Report Spring 2013

- Issue EPU Amendment 2015

Major Milestones Achieved

- NFPA Code compliance evaluations
- Nuclear safety capability assessment (NSCA) component selection, logics, cable selection, and cable routing (final owner reviews pending)
- Scoping fire modeling (generic treatments calculation)

Remaining Major Milestones

- Fire PRA completion (including peer review)
- Fire area assessments and variance from deterministic requirements (VFDR) resolutions
- Fire risk evaluations
- LAR preparation and submittal