



Monticello Extended Power Uprate Resubmittal



NRC Meeting
October 15, 2008

Meeting Agenda

- Background
- Steam Dryer Analysis
- Equipment Qualification
- Setpoint Methodology
- Grid Stability Study
- Changes to the LAR
- Overall Schedule
- Summary

Background

- EPU LAR Submittal 3/31/08
- LAR withdrawn on 6/25/08
- Three items
 - Steam Dryer Evaluation
 - Equipment Qualification
 - Instrument Setpoint Methodology

EPU Project Principles

- Maintain or improve safety and risk profile
- Improve or enhance equipment reliability
 - Follow existing regulatory processes
 - Use industry operating experience
 - Coordinate with License Renewal and Life Cycle Management projects
 - Minimize the impact on day-to-day operation
 - Extract value from standardization, economies of scale, with minimal duplication

Plant Background

- GE BWR 3
- 1971 began operation at 1670 MWt (OLTP)
- 1998 increased power to 1775 MWt (CLTP)
- 2008 EPU application to 2004 MWt (120% OLTP)
 - Power increase in two stages
 - After EPU approval - Increase to approximately 1870 MWt
 - After 2011 outage - Increase to full EPU at 2004 MWt

Monticello Steam Dryer Information

- GE 1965 Product Line, Square Hood
- Steam dryer licensing basis accident is main steam line break outside of containment
- Steam dryer inspection per Boiling Water Reactor Vessel Internals Project (BWRVIP-139)

Industry Steam Dryer Information

- EPRI and BWRVIP initiative to provide a consistent steam dryer evaluation method:
 - BWRVIP-182 for steam dryer evaluation methodologies (Submitted January 30, 2008)
 - Continuum Dynamics Incorporated (CDI) licensing topical report (planned submittal late-2008)
 - RG 1.20, Revision 3
 - 90 day startup reporting exception

Monticello Steam Dryer Evaluation Approach

- Steam Dryer Analysis (BWRVIP-182)
 - Screening of susceptibility to acoustic excitation validated by scale model tests
 - Strain gage measurements of CLTP main steam line (MSL) acoustics
 - Acoustic circuit model (ACM) of steam dome
 - Load definition at CLTP
 - Finite Element Model (FEM) of dryer at CLTP
 - Limit curves for EPU power ascension

MSL Data

- Strain Gage data taken in 2007 at 28% and 100% CLTP, and during recent startup
- Filters applied for pipe bending, recirc pump electrical and vane passing frequency noises
- Submodel analysis applied
- Bias and uncertainty applied per CDI LTR

Dryer Evaluation Results

- SRV standpipe resonant frequency approximately 162 Hz at CLTP
- EPU steam velocity of 179 ft/sec is below the lowest calculated resonance onset velocity of 185 ft/sec
- Scale model test acoustic resonance velocity is 201 ft/sec
- CLTP minimum alternating stress ratio is >2.0
- EPU minimum alternating stress ratio is >2.0

Steam Dryer Flaw Evaluation

- There is no effect on component stiffness and modal response due to cracking.
- The potential for crack growth due to fatigue is minimal.

Steam Dryer Summary

- Evaluated per BWRVIP-182 and CDI LTR
- The impacts of flaws and flaw growth are evaluated
- Minimum alternating stress ratio is > 2.0

Equipment Qualification

- MNGP has completed the environmental qualification analyses
- Results show that two transmitter modifications are required for EPU implementation
 - Modification paperwork complete by submittal
- EQ files for 10CFR50.49 qualification will be complete prior to EPU implementation

Instrument Setpoint Calculation Methodology

- MNGP employs NRC approved GE Setpoint Methodology
- Setpoints are calculated from the analytical limit (AL)
- Margins calculated between the AL and the allowable value (AV) and between the AV and the nominal trip set point (NTSP)

Instrument Setpoint Calculation Methodology

- AL/AV margin includes measurement accuracy, primary element accuracy, instrument loop accuracy and calibration errors
- AV/NTSP margin includes loop accuracy under calibrated conditions, calibration errors and drift errors

Instrument Setpoint Calculation Methodology

- Two Setpoints are calculated
 - AL/NTSP1 contains all errors and is equivalent to the limiting trip setpoint (LTS) in RIS 2006-17
 - NTSP2 is calculated to provide 90% confidence the AV is not exceeded during surveillance tests
- The final setpoint is selected to satisfy both NTSP1 and NTSP2 and is equivalent to the nominal setpoint in RIS 2006-17

Instrument Setpoint Calculation Methodology

- Examples of as found and as left tolerances (AFT and ALT) are included in sample calculations
- MNGP procedures require shift manager determination of immediate operability if an instrument is found to be out of tolerance
- The condition is entered into the corrective action process if the AFT is exceeded
- All setpoints are reset to the NTSP within the ALT after calibration

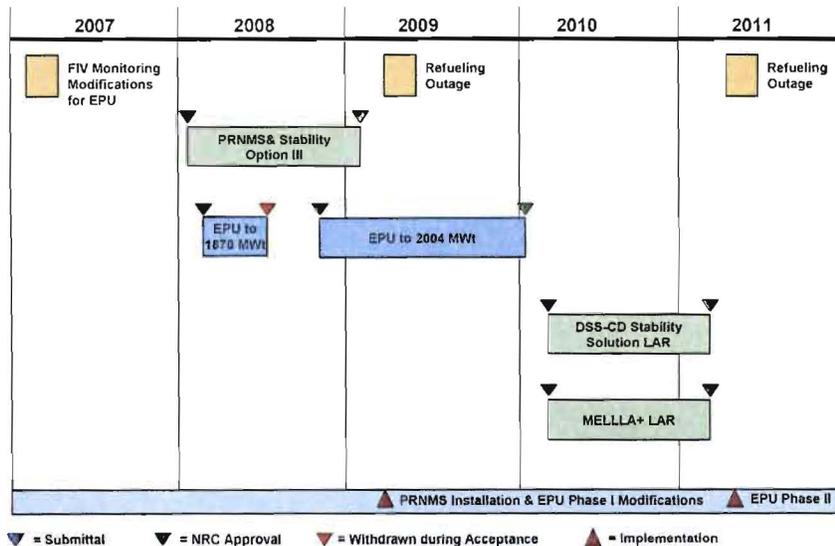
Grid Stability Study

- Study completed for both stage I (1870MWt) and stage II (2004 MWt)
- No impact on grid stability at either power level
- MISO interconnection tariff requires the maintenance of 0.95 leading/lagging power factor capability

Changes to the LAR

- Non-Acceptance Open Items Addressed
- Acceptance Review Questions Documented
- Industry RAIs Evaluated
- Steam Dryer Submittal Enhanced
- Grid Stability Summary Completed

Monticello Schedule



Summary

- MNGP EPU LAR will be submitted early November 2008
- Addresses prior NRC items
- Considers RAI's from previous submittals

Questions?