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# **TENNESSEE VALLEY AUTHORITY BROWNS FERRY NUCLEAR PLANT**

## **Extended Power Uprate Steam Dryers**

**March 20, 2008**

# Steam Dryer Analyses



- Unit 1 Analysis
  - Submitted March 6, 2008
  - Includes:
    - Unit 1 specific strain gage data
    - Latest bias and uncertainty
    - FEM corrections
    - Noise reduction
  - Results

Location	Node	SR-P	SR-a	Freq. Shift (%)
1. Top Cover Inner Hood/Top Cover Overlap/Top Perf. Plate	88059	3.03	1.56	5
2. Top Cover/Tie Bar Base	107054	3.47	1.59	10
3. Top Cover/Tie Bar Base	102407	3.29	1.62	2.5
4. Top Cover Middle Hood/Top Perf. Plate/Top Cover Overlap	91420	3.05	1.63	10
5. Top Cover/Tie Bar Base	96561	3.96	1.94	10
6. Top Perf/Top Cover/Dam Plate	103088	4.31	1.98	7.5
7. Submerged Drain Channel/Skirt	104539	2.57	2.15	10
8. Dam Plate/Lock	102521	4.76	2.19	7.5
9. Top Cover Inner Hood/Hood Support/Tie Bar Base	103094	4	2.28	10
10. Top Perf/Top Cover/Dam Plate	103089	5.14	2.4	5

# Steam Dryer Analyses

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- Unit 2 Analysis
  - Scheduled to be submitted March 31, 2008
  - Will include:
    - Latest bias and uncertainty
    - FEM corrections
    - Noise reduction

# Steam Dryer Analyses

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- Unit 3 Analysis
  - Scheduled to be submitted June 2008
  - Will include:
    - Unit 3 specific strain gage data
    - Latest bias and uncertainty
    - FEM corrections
    - Noise reduction
  - Outage status
    - Outage began March 18
    - Acoustic vibration suppressors will be installed
    - Strain gage data will be obtained following restart

# Steam Dryer Analyses

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- Potential for SRV Resonance
  - Frequency range 105 Hz to 112 Hz most likely
  - No demonstrated SRV resonance at CLTP velocities from plant data
  - 1/5 Scale testing of A & B main steam lines
    - Testing shows SRV frequency onset starting at CLTP and small increase at EPU Mach numbers
  - 1/8 Scale testing for EPU prediction
    - In progress
    - Used to determine need for mitigation modifications

# RAI Status

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- Group 1 - January 31, 2008
  - Generic questions, plans to use unit-specific data, clarifications
- Group 2 - March 6, 2008
  - Unit 1 stress analysis, damping
- Group 3 - March 31, 2008
  - Unit 2 stress analysis, misc.
- Group 4 - June 15, 2008
  - Unit 3 stress analysis

# Steam Dryer Monitoring Plan

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- Draft provided for discussion
- Modeled after Vermont Yankee
- Includes
  - Test plateaus at 5%
  - Power increments of 2.5%
  - Performance criteria based on limit curves
  - Proposed license conditions