



Entergy VY Power Uprate Project

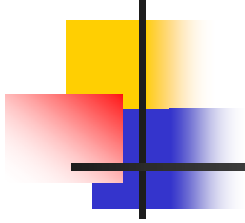
NRR Management Presentation

May 9, 2005



Introduction

John Dreyfuss – VY Director of Engineering



Agenda

- Summary of VY EPU
- Overview of Submittals
 - Steam Dryer Analysis
 - Accident/Transient Codes & Methods
 - Station Blackout
- Plans Going Forward



Summary – VY EPU

- December 2001 – Start Project
- September 2003 – Power Uprate Submittal
- January 2004 – NRC Acceptance
- April 2004 – Outage Modifications
 - VYNPS ready for 115% operation



Summary – VY EPU (cont)

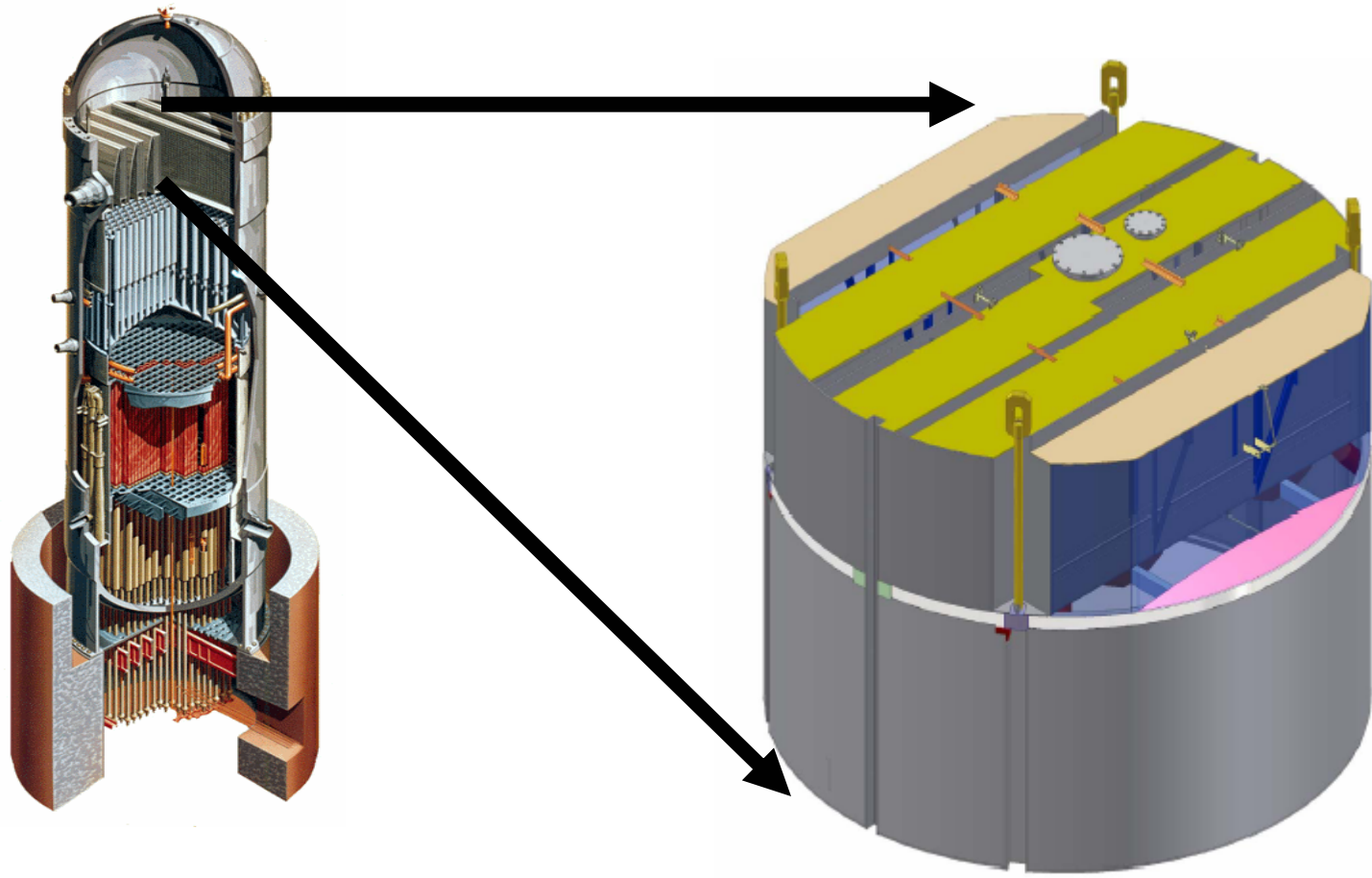
- 28 License Amendment Request Supplements
- Responses to 161 RAI's
- No Outstanding Supplements or RAI's



Submittals in Review

- Steam Dryer Analysis
- Accident/Transient Codes & Methods Applicability
- Station Blackout

Main Steam Dryer





Steam Dryer VY Analysis - Overview

- Industry OE and Lessons Learned
- VY-specific work:
 - Acoustic circuit model
 - Benchmark validation
 - Computational fluid dynamics (CFD) model
 - Finite element structural model
 - Proactive strengthening modification
 - Dryer monitoring during power ascension



Steam Dryer

FIV Measurement Instrumentation

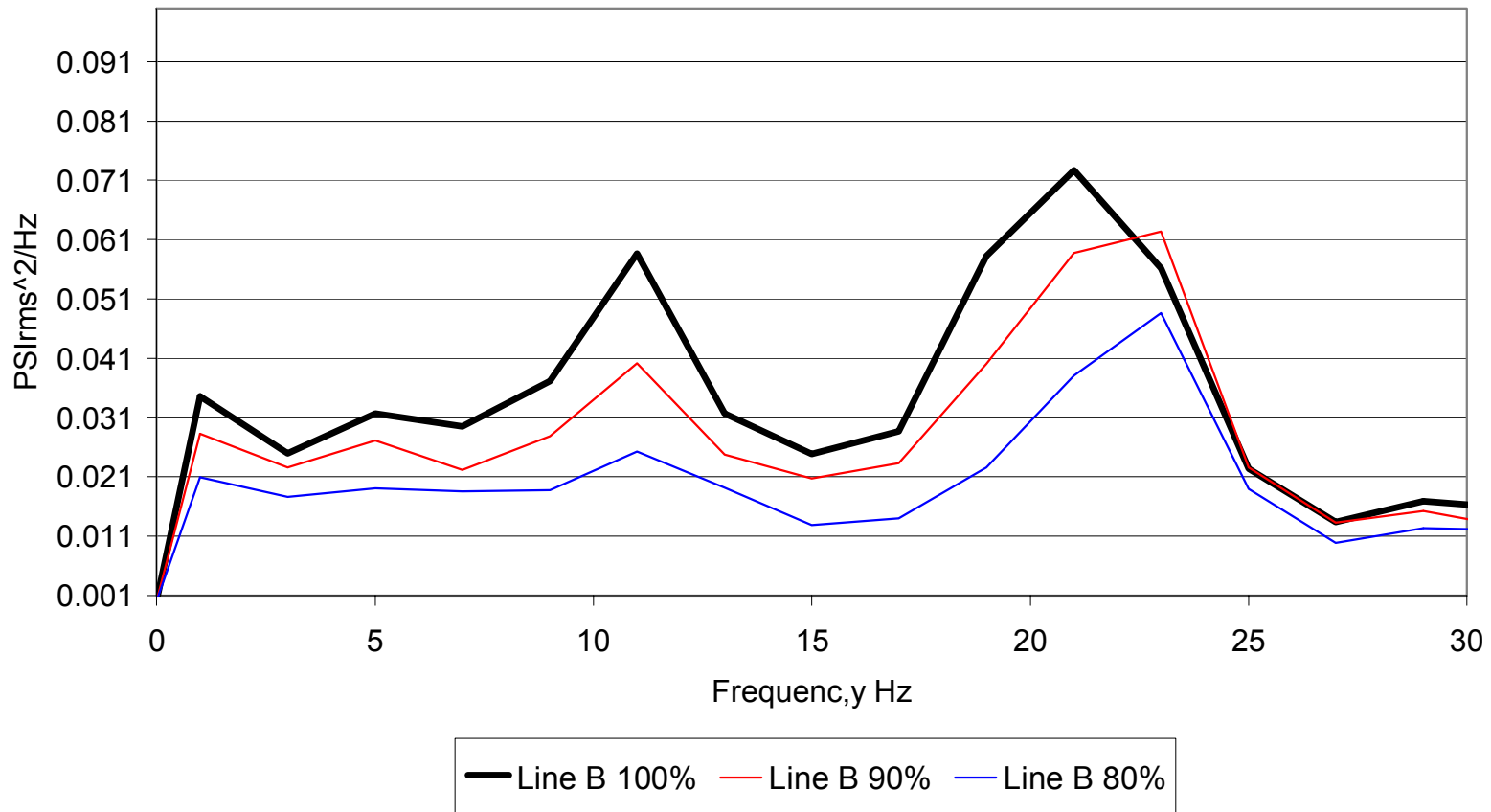
- 8 Strain Gages on Main Steam Lines
- 4 Pressure Transmitters on MS Venturis
- 31 Accelerometers in Drywell
 - 21 on main steam lines
- VY Vibration is Very Low



Steam Dryer

VY Acoustic Loads Trend 80-100% Power

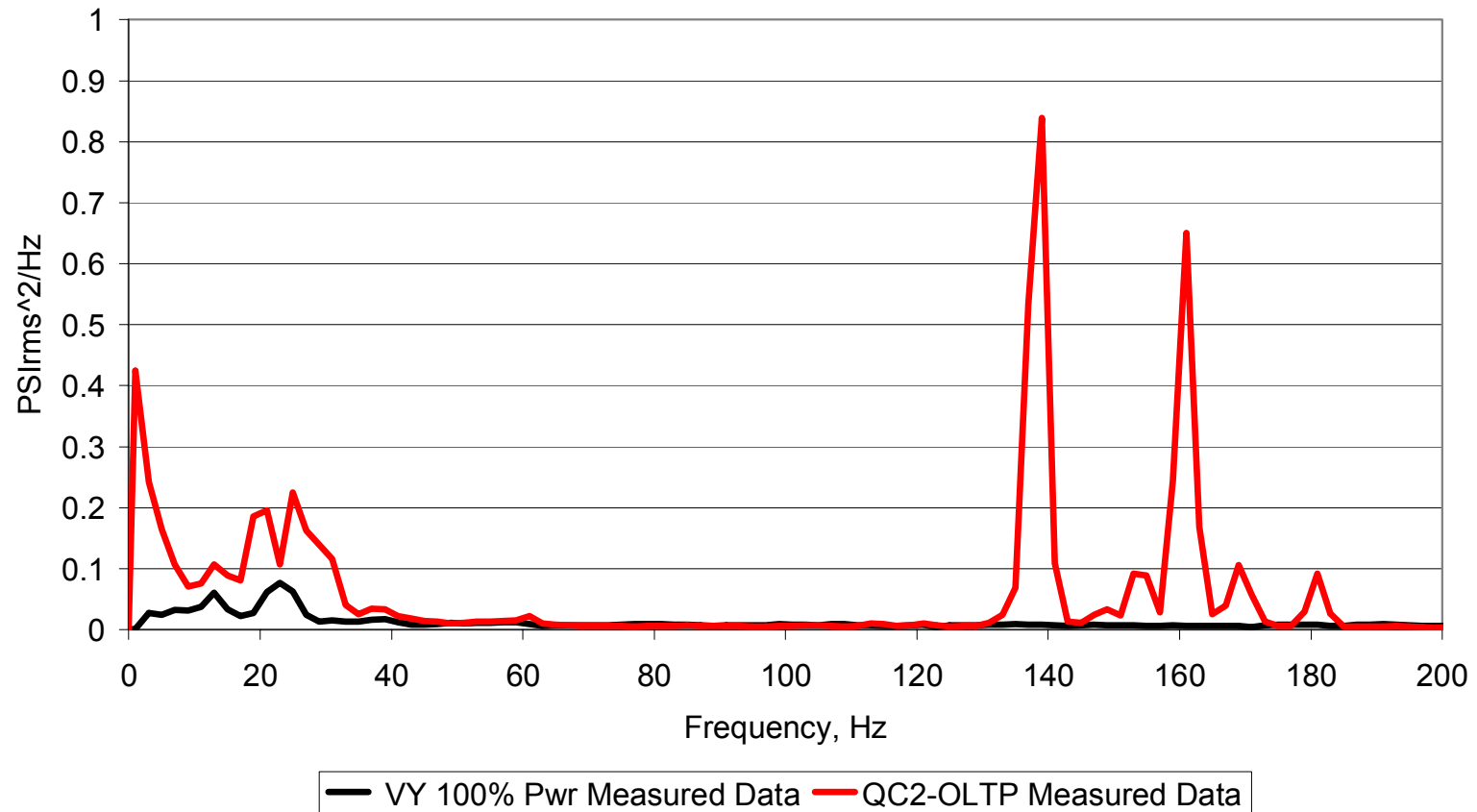
Vermont Yankee PSD Curves
Steam Line B
PSD Signature VY Measured Data 80%, 90%, 100% Power





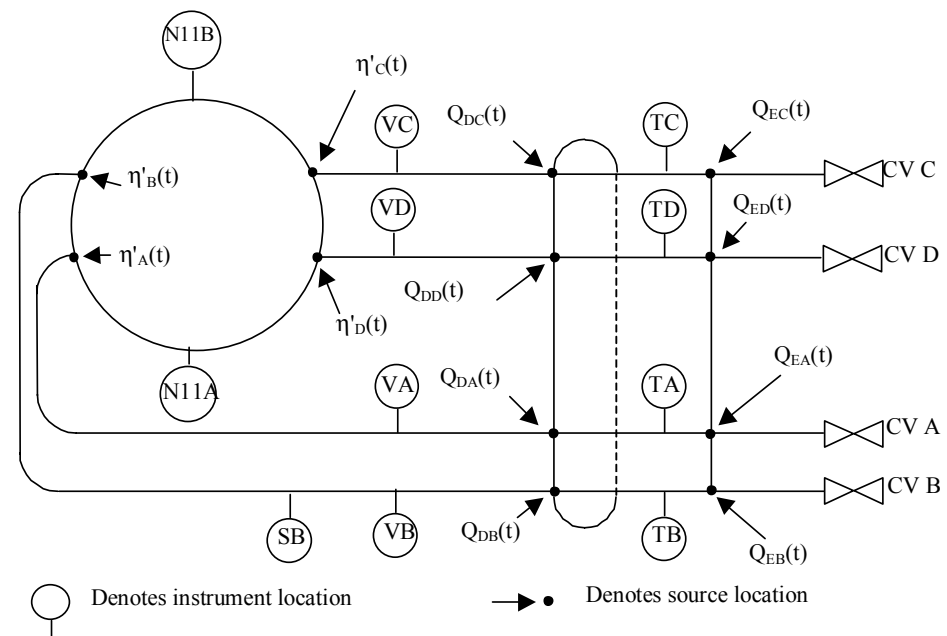
Steam Dryer FIV Measurement Comparison

Steam Line Data PSD Comparison
QC2 (OLTP) vs. VY 100% (CLTP)



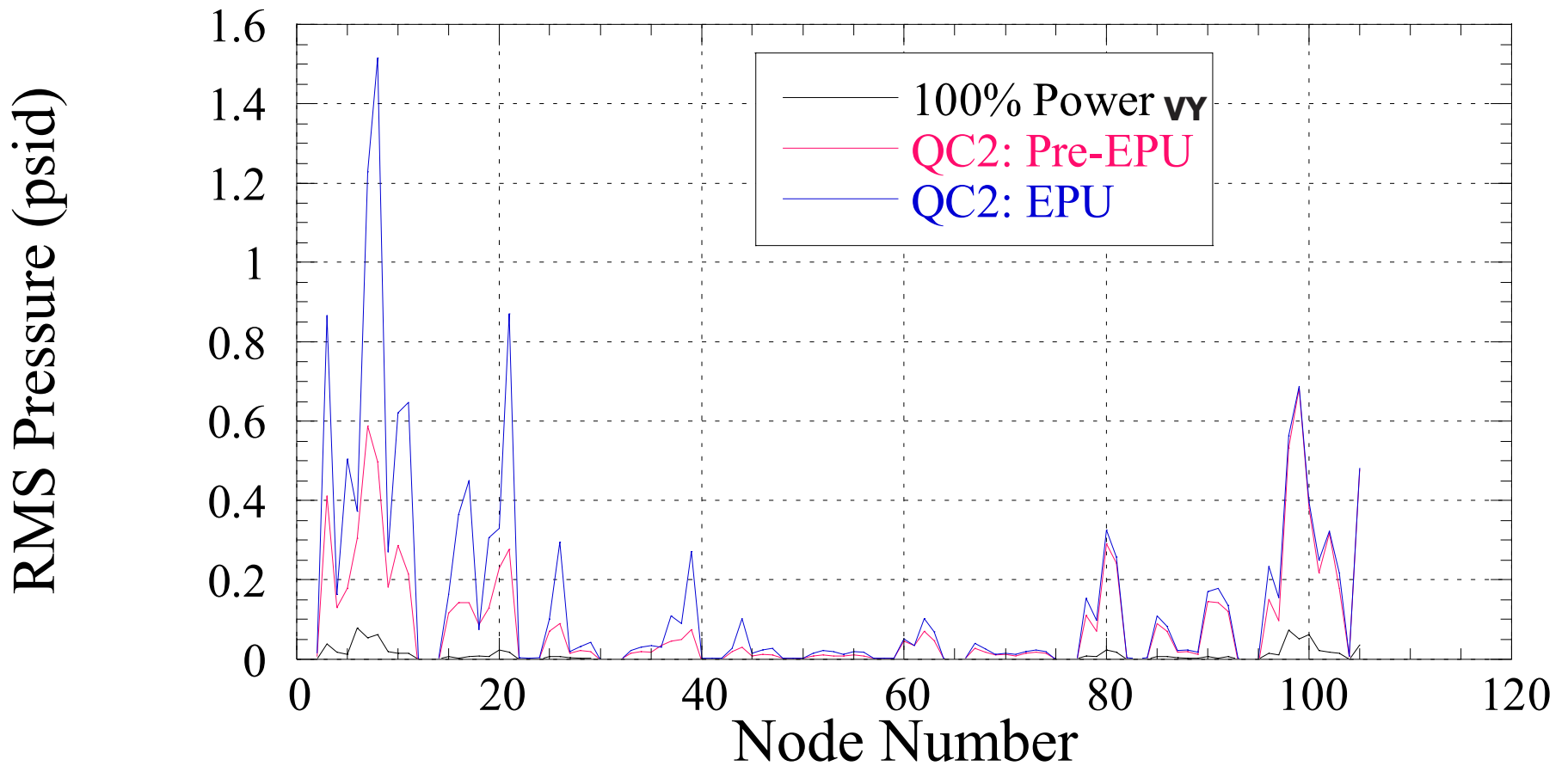
Steam Dryer Acoustic Analysis

- Minimal acoustic loads at 80% - 100% power
- Potential acoustic sources identified for power ascension monitoring



Steam Dryer

Acoustic Analysis – VY vs QC Loads

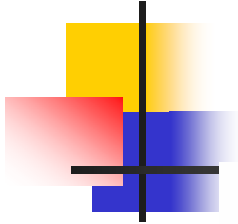




Steam Dryer

VY Acoustic Analysis - Benchmark

- Test Plan & Data Acquisition
 - GE scale model (SMT)
 - 13 test cases
 - Separate from Exelon tests
- CDI prediction
 - Model of SMT
 - Used only steamline data to predict
- Entergy results comparison
 - Viable, applied conservatively

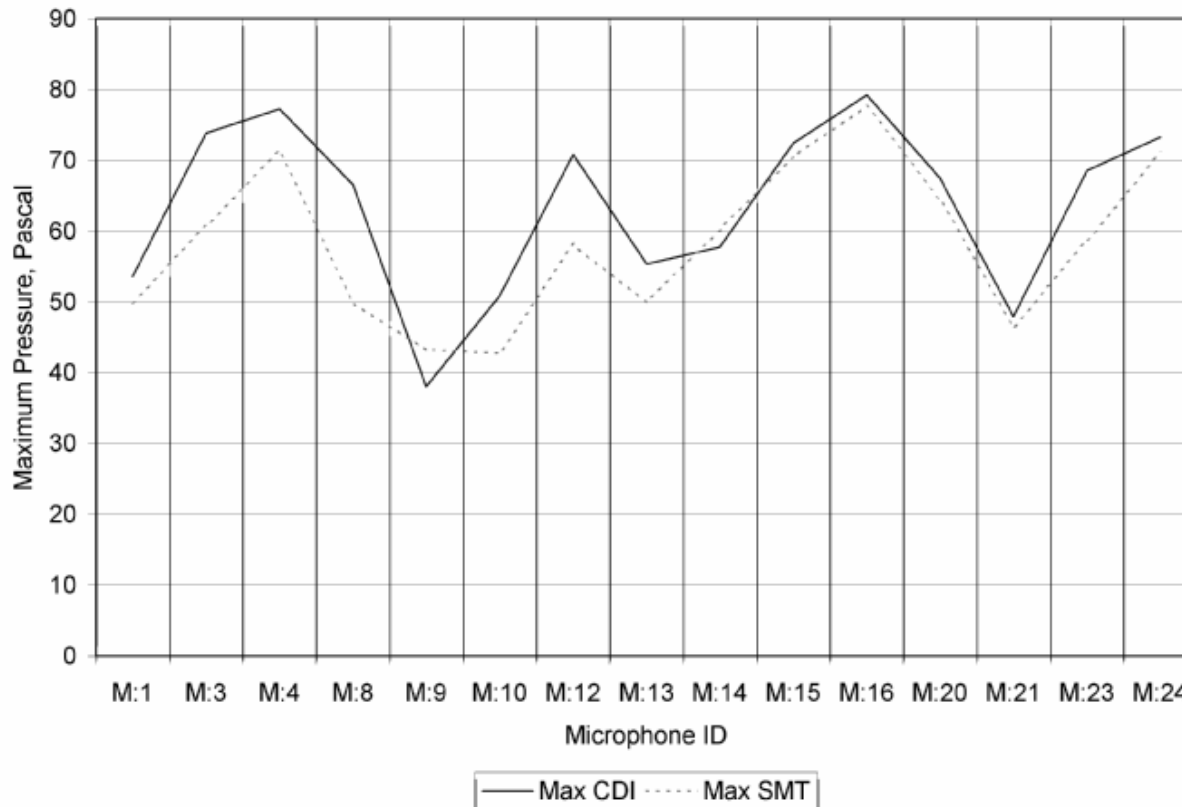


Steam Dryer Acoustic Analysis – Benchmark

App_G_CompareVY12R1R1.xls

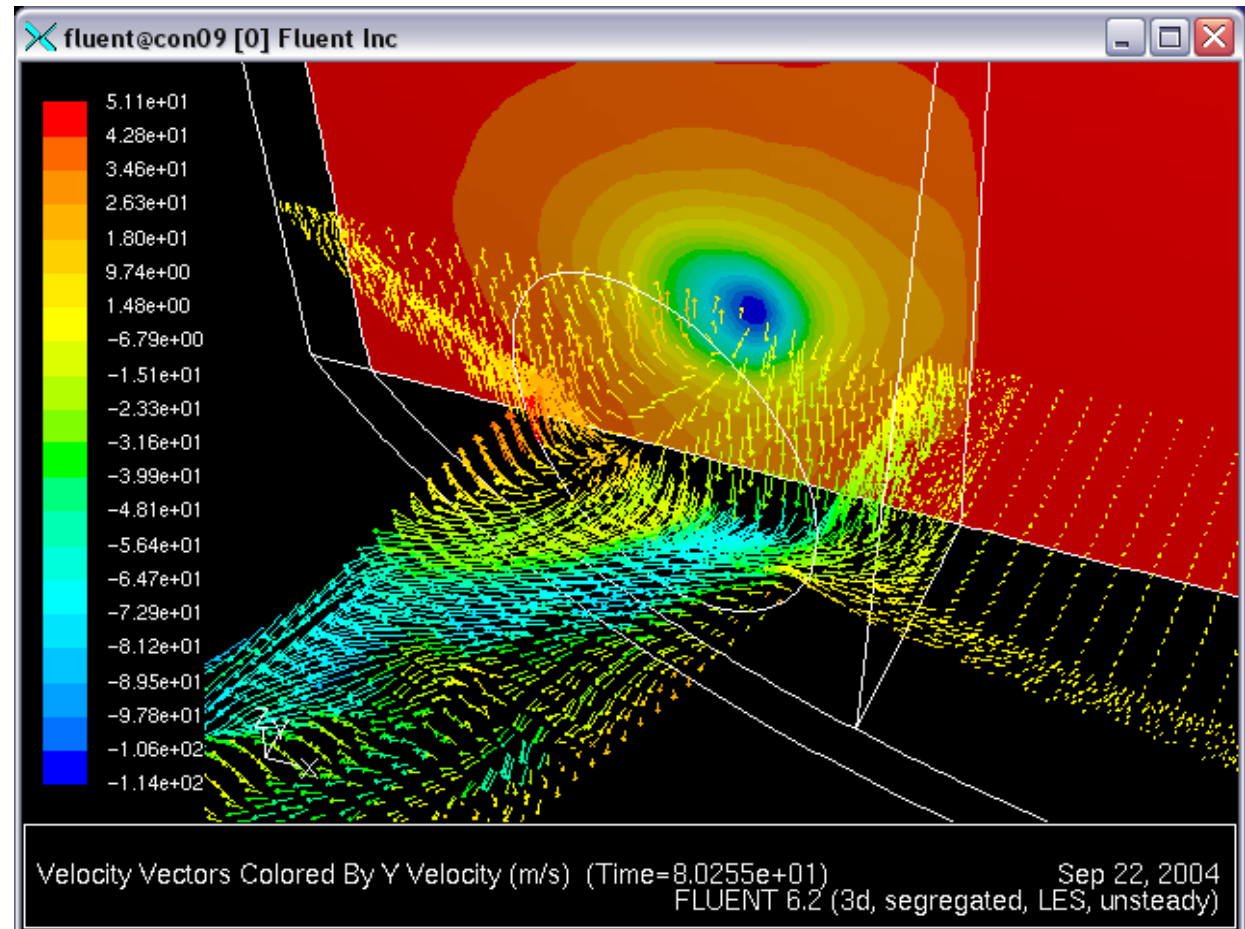
Acoustic Model Benchmark
Appendix G, VY12R1 Chirp with 81 CFM Flow
Microphone Mall Max

5/9/2005



Steam Dryer Fluid Dynamics Analysis Loads

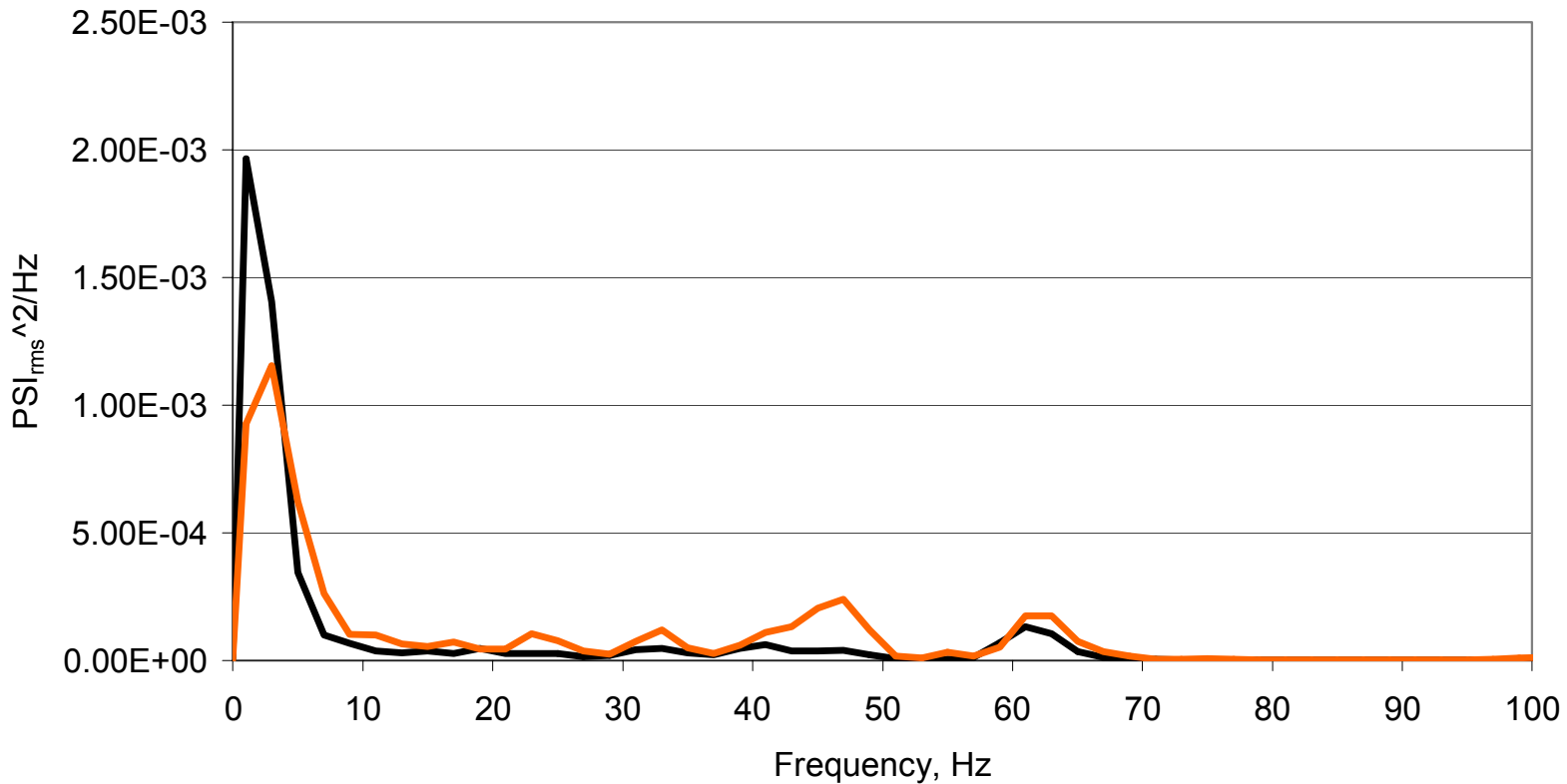
- Vortex shedding produces loads
- Low magnitude, contribute slightly less than acoustic





Steam Dryer Fluid Dynamics Analysis Loads

Vermont Yankee CFD Loads, Point on Dryer Face
100% and 120% Power



— CFD Point L2 100% — CFD Point L2 120%



Steam Dryer

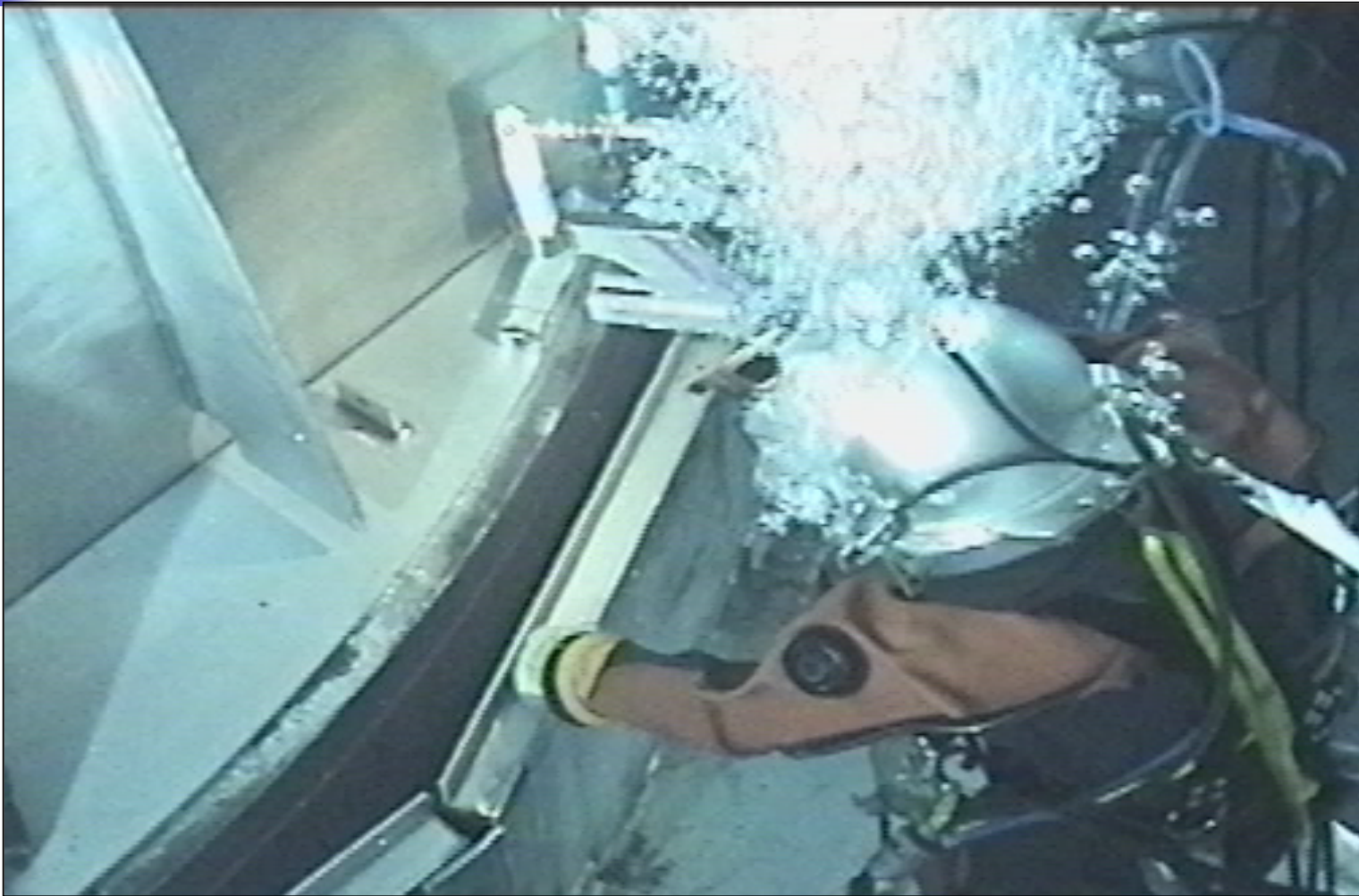
VY Analysis - Key FIV Stress Results

	Acoustic Max Surface Stress (psi)	Vortex Shedding Max Surface Stress (psi)	Weld x Stress Concentration Factor	CLTP Peak Stress (psi)	Fatigue Stress Limit (psi)	Margin to Limit (%)
Horizontal Plates:						
Inner Hood Base Plate	691	46	1.8	1,328	13,600	1,024%
Top Hood	538	92	4.61	2,900	13,600	469%
Vertical Plates:						
Outer Hood Bottom Weld	646	171	1.8	2,810	13,600	484%
Gussets:						
New Cover Plate- Front Hood Gusset	1,236	728	1.8	3,535*	13,600	385%

* Highest component stress



Steam Dryer VY Strengthening Modification





Steam Dryer Power Ascension Monitoring

- License Condition
 - Deliberate, controlled power increase
 - Frequent data collection & evaluation
 - FIV measurements
 - Hourly during power increase & within 1 hour of achieving each 2.5% step
 - Moisture carryover every 24 hours
 - Acceptance criteria
 - Level 2: 80% of Level 1 ASME endurance limit
 - Level 1: spectra projected to ASME endurance limit

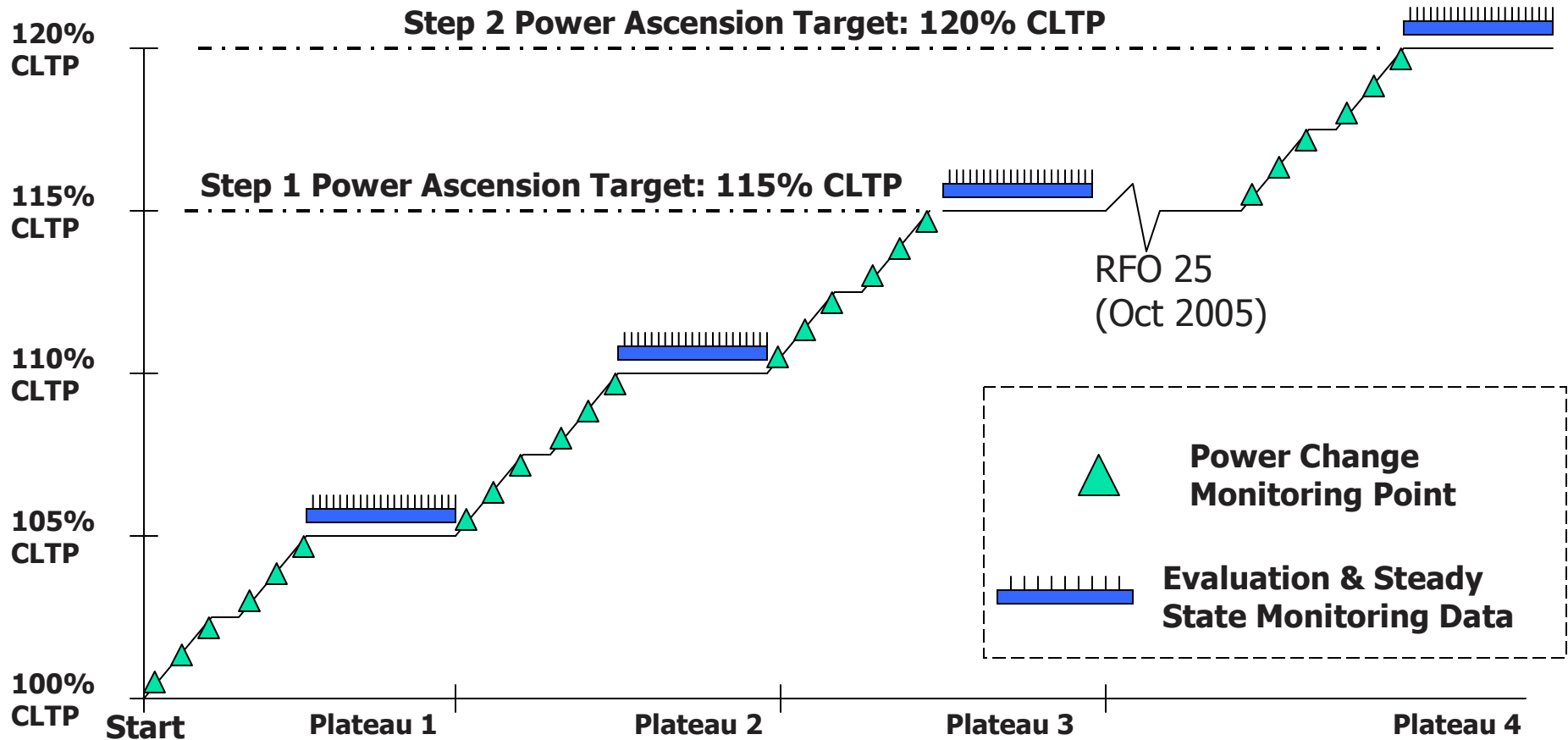


Steam Dryer Power Ascension Monitoring

- License Condition (cont.)
 - Action statements
 - Exceed Level 2: justify further power increase will not exceed Level 1
 - Exceed Level 1: initiate power reduction to acceptable level within 2 hours



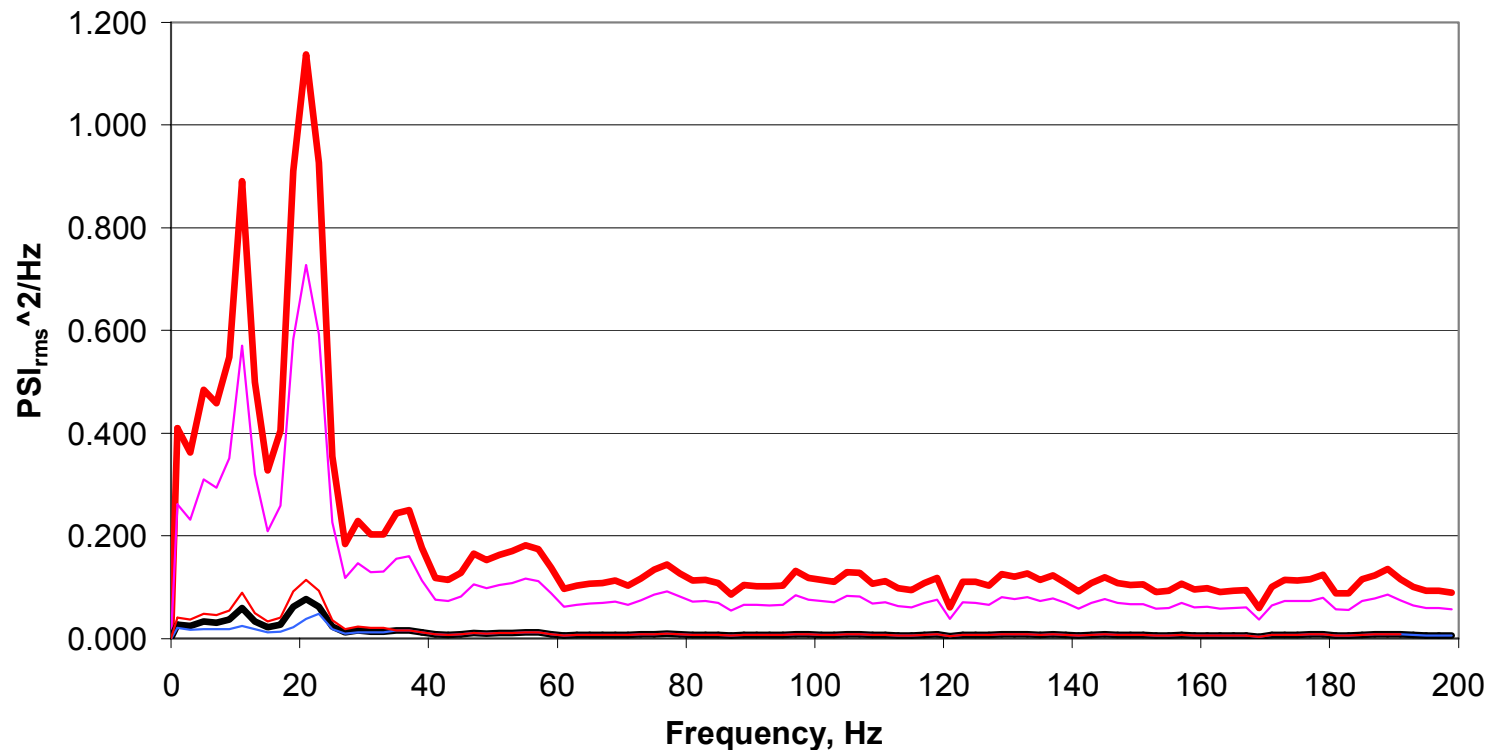
Steam Dryer Power Ascension Monitoring





Steam Dryer Power Ascension Monitoring

Vermont Yankee EPU Power Ascension Test
Pressure PSD Spectra Limits, Sample Steam Line B



- VY Level 1 EPU Limit (<ASME C Endurance Limit)
- VY Level 2 Curve (<80% of ASME Endurance Limit)
- VY 100% Pwr Measured Data
- VY 80% Pwr Measured Data
- VY 120% Pwr Projected Data w/o Resonance



Codes & Methods Applicability

- Generic Issue
 - NRC actively reviewing issues in MELLLA+
 - Large GE EPU operating experience base
 - RAI response demonstrates VY EPU operation is within experience base



Station Blackout

- Engineering Inspection Finding
- Manning of Alternate AC Source Changed
- Coping Evaluation & Timeline Results Submitted
- No Plant Modifications Required



VY EPU

Process Going Forward

- Remaining NRC Activities:
 - NRR complete draft safety evaluation
 - ACRS review



VY EPU

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- NRC Questions



Entergy VY Power Uprate Project

Closing Remarks