

BNP - USNRC Region II Update

**Neil Gannon
November 25, 2003**



Discussion Topics

- Organizational Changes
- U2 Scram
- U2 HPCI Inoperability
- Security
- Extended Power Uprate
- Fire Protection
- Fuel Performance
- Other Items...



Site Organization Changes

- Jack Keenan to Power Operations VP
- Neil Gannon to Site VP
- Bill Noll to Director of Site Operations
- David Hinds to Plant General Manager
- Engineering Manager TBD



Unit 2 Reactor Scram November 4, 2003

- Generator Exciter Collector Ring Brush Rigging Assembly failed causing a rapid voltage reduction
- Turbine/Generator Trip
- Reactor Scram



Unit 2 Reactor Scram

- The Reduced Voltage condition causes post Scram complications
 - MSIV closure
 - Trip of Both Reactor Feed Pumps
 - 4160v E-Bus Load Shed of running equipment (per design)
 - 2A Standby Gas Treatment
 - ERFIS Modules
- Second Scram signal received



Unit 2 HPCI Event November 12, 2003

- HPCI placed under clearance Dayshift for maintenance. Nightshift removes clearance and leaves turbine exhaust, 2-E41-F021 closed.
- Nightshift performs post maintenance testing, including full flow test of HPCI. Upon turbine roll the steam exhaust path is blocked causing the failure of the rupture diaphragms and steam exit into the HPCI room. CO2 system actuates also.
- Root Cause is configuration control and inadequate independent verification.



Security Update

Ed O'Neil



Security Update

- NRC Security Orders
 1. Interim Compensatory Measures (2002)
 2. Access Authorization (2003)
 3. Fitness For Duty Enhancements (2003)
 4. Security Personnel Training (2004)
 5. Design Basis Threat (2004)



Security Update

1. Interim Compensatory Measures (2002)
 - Implementation Completed August 31, 2002
 - Requirements are On-going
 - BNP adopted “Interim” approach



Security Update

2. Compensatory Measures Related to Access Authorization
 - Partial Implementation in Accordance with the Order
 - Full Implementation by January 7, 2004
 - On Track to Meet Implementation Schedule



Security Update

3. Compensatory Measures Related to Fitness-For-Duty Enhancements
 - Implementation Completed by October 29, 2003
 - Corporate Implementation for Consistency and Industry Best Practices



Security Update

4. Compensatory Measures Related to Training Enhancements for Security Force Personnel
 - Implementation Schedule Submitted
 - Revised Guard Training and Qualification Plan to be Submitted by April 29, 2004
 - Implementation Completed by October 29, 2004



Security Update

5. Revised Design Basis Threat
 - Revised Physical Security and Safeguards Contingency Plans as well as Implementation Schedule to be Submitted by April 29, 2004
 - Implementation Completed by October 29, 2004



BNP EXTENDED POWER UPRATE PROJECT

Bob Kitchen



BNP EPU Summary

- Two Step Uprate in progress
- 4 Major License Amendments
- 1st Power Uprate complete on both units
 - Unit 1 power at 113.3% OLTP
 - Unit 2 power at 116% OLTP
- 2nd Power Uprate in 2004 & 2005
 - Each unit will achieve 120% OLTP
- Will achieve 210 – 230 MWe



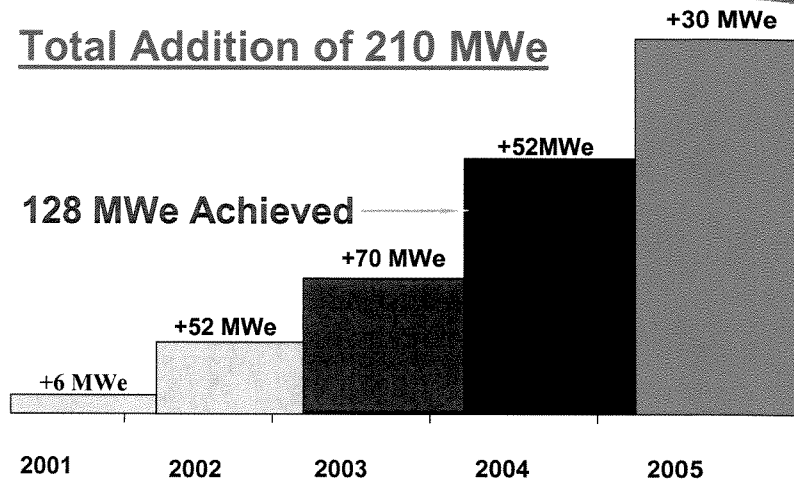
2004 Unit 1 Major Modifications

- MELLLA+ License Implementation
- Main Transformers
- Moisture Separator Reheater (MSR)
 - Relief Valve Upgrade
 - Tube Bundle and Reheat Section
- Feedwater Heaters (3)
- Isophase Cooling
- Condensate & Feed Pump Upgrades



2001 – 2005 BNP Power Uprate

Total Addition of 210 MWe



 Progress Energy

EPU Implementation Challenges

- MELLLA+ License
 - Needed for full power base load operation
 - BNP is Lead Plant
- Reactor Core Design
 - 120 % Original Licensed Power
 - 2-year operating cycle
 - 97% capacity factor
- Reactor Dryer Structural Design
 - Quad Cities failures (BWR-3)
 - BNP evaluation in progress

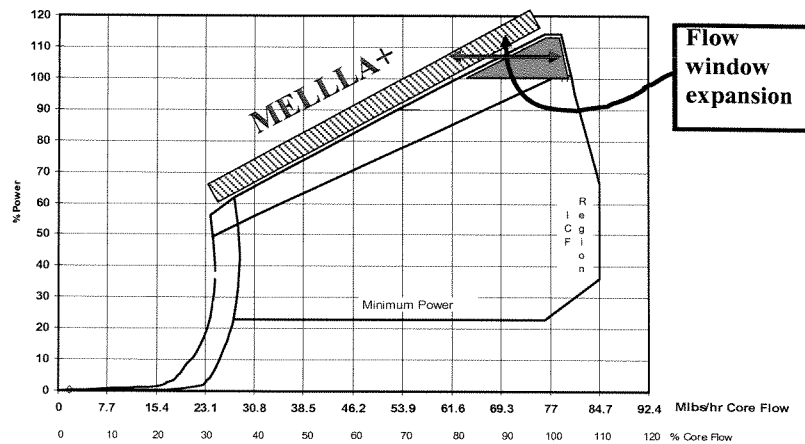
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MELLLA+ Overview

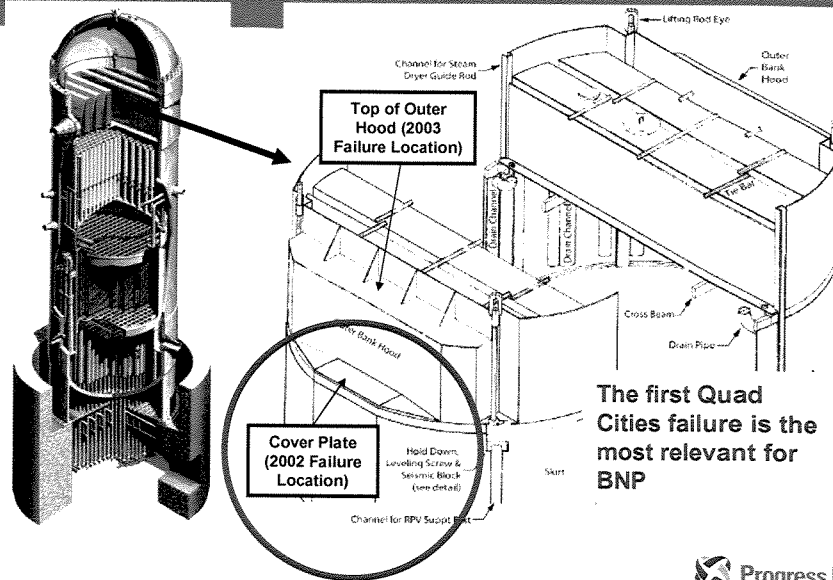
- MELLLA+ Is an Extension of the Existing Power Flow Map
- At Full Uprate Conditions, the Existing Flow Window Is Very Restrictive
 - 3.0% Unit 2
 - 5.5% Unit 1
- MELLLA+ Provides Flow Window for Sustained Operation at 120% OLTP



Expanded Power-Flow with MELLLA+

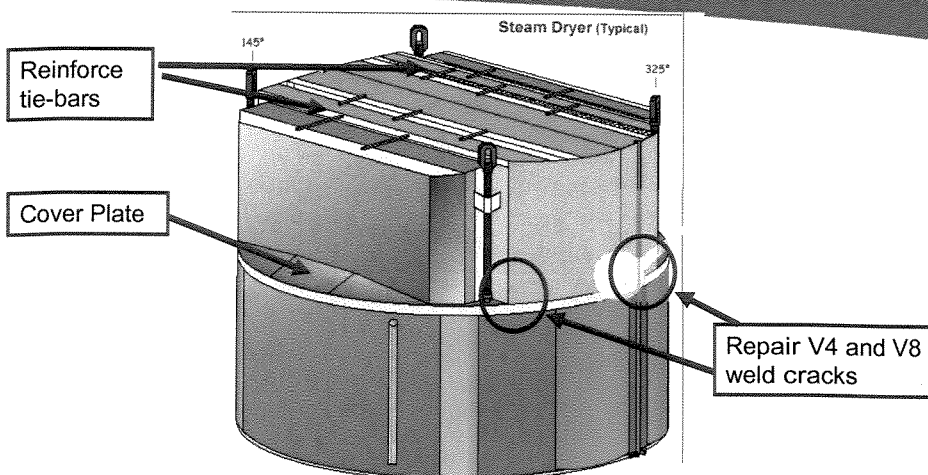


Quad Cities Dryer Failures



 Progress Energy

BNP Dryer Modifications & Repairs



 Progress Energy

Benefits of Power Uprate

- Improves plant margins & efficiency
- Addresses equipment aging & obsolescence
- Improves staff capabilities
- Low cost generation
- Significant financial value



Fire Protection

David Hinds



Manual Action Feasibility Validation & Reduction

- Safe Shutdown Manual Action Validation
 - Establish Safe Shutdown Supporting Calculations
 - Confirm Timeline Requirements
 - Document Feasibility Using NEI 00-01, Appendix E
 - Perform Blackout Testing of Emergency Lighting
 - Upgrade Operator Training Job Performance Measures
 - Revise Engineering Documentation/Operating Procedures
- Manual Action Reduction
 - Preliminary Review Identified Potential to Eliminate Approximately 24 of the 40 "Unapproved" Manual Actions
 - Revise Engineering/Training/Operation Documentation



Fire Detection System Replacement Project

- Replacing the original "high voltage" fire detection system
- Protects 19 Buildings; >1100 devices
- Installing an addressable fire detection/alarm system
 - Looped Network, with 10 local panels
 - Incipient fire detection for the Cable Spread Rooms (air sampling)
 - Graphics Work Station for each Unit Control Room
- Design Phase is under way
 - 10 Mod packages being prepared 8/03 – 09/04 (building basis)
- Installation to begin in 3rd Qtr 2004; completion 2nd Qtr 2006



Cable Spreading Room Sprinkler Violation

- Floor Mounted Sprinkler System Installed in mid-1980's as Committed to the NRC
- Green NCV – October 2002
- Meetings with NRC
 - Site Meeting – February 2003 (ADAMS ML030990690)
 - Teleconference – April 2003 (ADAMS ML031010331)



Cable Spreading Room Sprinkler Violation

- System Under Impairment with Hourly Fire Watch
- Modification Under Development:
 - Raise Portion of the Sprinkler System to the Ceiling (where Possible) and Use For Staging of Combustibles (Long Term Storage Still Prohibited)
 - Convert System from Manual to Automatic
- Restriction of Combustibles in Remainder of the Room
- Modification Implementation after 2004 Unit 1 Outage



BNP U2 Fuel Leak Update

David Hinds



Fuel Leaks

- History

- ▶ Fuel failures both units in '97-'98
- ▶ Unit 2 had 2 failed bundles in 2001– removed in 2002 mid-cycle outage
- ▶ Unit 1 had 3 failed bundles in 2001- removed in 2002 mid-cycle outage
- ▶ All recent failures GE-14 fuel – no GE-13 failures

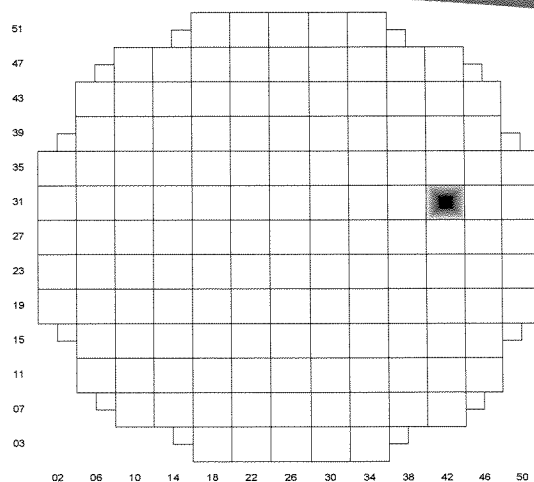


U2 Fuel Leak Update

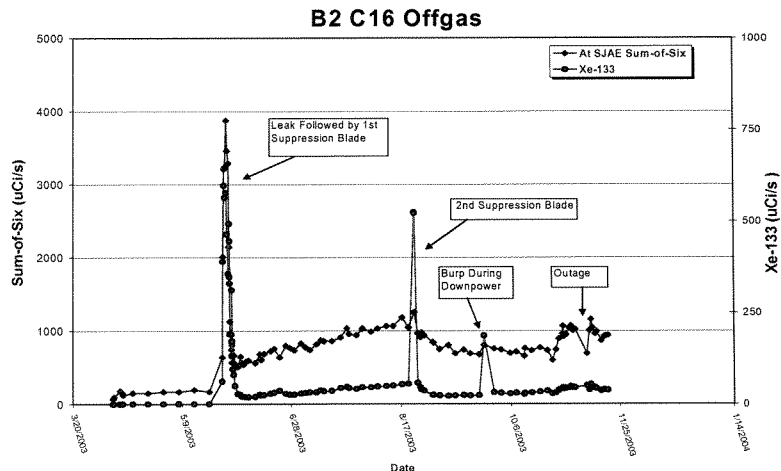
- Unit 2 Fuel Leak detected 5/27/03 (7 weeks into new cycle).
- Promptly suppressed with one control rod.
- Second suppression rod inserted 8/22/03.
- Leak believed to be GE-14 (most likely first cycle)



U2 Fuel Leak – Core Location



U2 Fuel Leak – Off-gas Trend



U2 Fuel Leak Update

- Limiting cladding stress by minimizing power increases above conditioned state.
- Reduced power in failed rod to slow degradation.
- Proactively managing suppression rods.
- Evaluating options for managing remainder of cycle – contingency for mid-cycle outage in May.

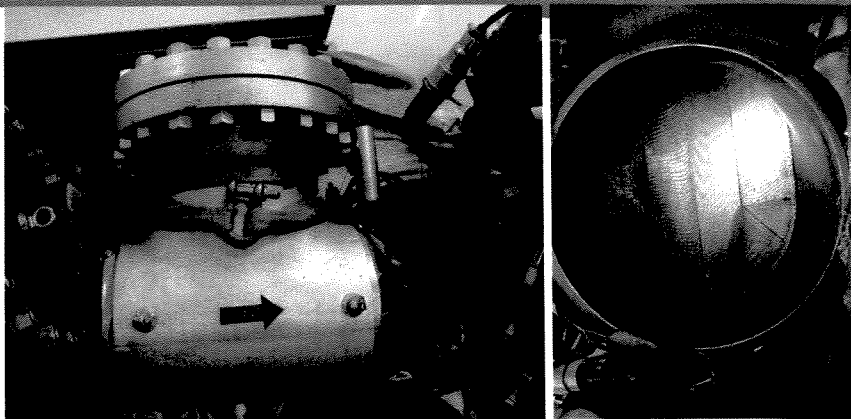


Fuel Reliability Improvement Efforts

- High flow T-strainers with removable stainless steel basket screens were installed in the discharge piping of the Unit 2 Heater Drain Pumps during B216R1
- Strainers of the same design will be installed in Unit 1 during B115R1



HD Strainer Assembly



Fuel Reliability Improvement Efforts

- Foreign material from the fuel debris filters may be falling from the filters during transport of the fuel from the core to the spent fuel pool (SFP). This foreign material may enter new fuel bundles stored in the SFP and be carried back into the core, thereby causing fuel failures.
- To address this, the locations of new, reinsert and discharge fuel in the SPF have been changed.



Fuel Reliability Improvement Efforts

- Foreign Material Exclusion (FME) enhancements
 - Established FME steering committee – multi-disciplined team
 - Increased observations and oversight
 - Project challenges
 - Procedural enhancements
 - Training
- Increased emphasis on inspection and retrieval of foreign material
- Procedure changes to flush system prior to injection



Fuel Reliability Improvement Efforts

- Fuel inspections while reconstituting Unit 1 bundles
- GNF Activities
 - New debris shield design
 - Next generation debris filter
 - Spacer design review/testing
 - Cladding resistance to debris failure
 - FME inspections at GNF



Other Items/Questions

