

Brunswick Nuclear Plant Units 1 and 2

NFPA 805 Pre-LAR Application Meeting May 31, 2012

Jeff Ertman – NFPA 805 Project Manager



Agenda

- Transition Project Overview
- License Amendment Request Overview
- Fire PRA Overview

Acronyms

- FPRA – Fire Probabilistic Risk Assessment
- FP – Fire Protection
- FSA – Fire Safety Analysis
- DID – Defense in Depth
- NSCA – Nuclear Capability Safety Assessment
- SSA – Safe Shutdown Analysis
- FRE – Fire Risk Evaluation
- RA – Recovery Action
- HRA – Human Reliability Analysis
- CPT - Control Power Transformer
- VFDR – Variance From Deterministic Requirements
- NPO – Non-Power Operations
- EPU – Extended Power Uprate
- F&O – Findings and Observations
- MSO – Multiple Spurious Operations

Presenters

- ▶ Jeff Ertman - NGG, Fleet FP Supervisor, 805 PM
- ▶ Alan Holder - NGG, Fleet Fire Protection Lead
- ▶ Ed Wiegert - NGG, Fleet Fire PRA Lead
- ▶ Kelly Lavin - NGG, NFPA 805, LAR Development
- ▶ Lee Grzeck - BNP, Supervisor of Licensing
- ▶ John Becker - BNP, Supervisor Engineering Programs

On the Phone for PE:

- ▶ Leunis van Eeten – BNP, Project Tech Lead
- ▶ Robert Smith – NGG, Project Team
- ▶ Chris Browne – NGG, Project Team



Transition Project Overview

- Project Milestones
- Project Status

NFPA 805 Project Milestones

Milestone	Plant			
	HNP	BNP	RNP	CR3
SSA Validation Calculation	Complete	Complete	June 2012	Complete
FPRA Inputs Ready	Complete	Complete	Aug 2012	Complete
FPRA Peer Review	Complete	Complete	Dec 2012	Complete
EPU and Other Impacts	N/A	N/A	N/A	4Q 2013
NFPA 805 LAR Submittal	Complete	Sept 2012	Sept 2013	July 2014
Forecast LAR RAI's	Complete	3Q 2013	3Q 2014	1Q 2015
Forecast SE from NRC	Complete	1Q 2014	1Q 2015	4Q 2015
FP Program Implementation	Complete	3Q 2014	3Q 2015	2Q 2016
Target Project Closeout	2Q 2013	3Q 2015	4Q 2015	4Q 2016

Brunswick Project Status

- **Final Stage of PRA Development**
 - Revision of Quantification Calculation in Progress
 - Application Calculation in Progress (VFDR Evaluations)
- **FSAs In Progress**
 - FREs
 - RA Decisions
 - DID Decisions
 - Required Fire Protection Systems
- **LAR Development**
 - Early Stages
 - Site Review Scheduled to Start in July

License Amendment Request Overview

- Classical Fire Protection
- NFPA 805 Monitoring
- NSCA
- Modifications
- Treatment of Generic Issues
- LAR Document

Classical Fire Protection

- NFPA 805 Chapter 3 (B-1 Table)
 - Revision of NFPA Code Compliance Calculations in Progress
 - Three Potential Modifications
- Radiation Release During Fire Brigade Response
 - Preliminary Review at BNP in Late 2007
 - Updating to Current LAR Template
 - Incorporating Non-Pilot LAR Feedback

NFPA 805 Monitoring

- Same Base Program as Harris
- Makes Use of existing NGG Fleet Procedure
- BNP Submittal Updated With NEI 04-02, FAQ 10-0059

NSCA – at Power

- SSA Fire Area Analysis Complete
- VFDRs Identified
 - Additions Due to Exemption Elimination
- Recovery Action Strategy
 - Minimize III.G.3 RA Transition
 - DID Review In Process
 - Minimize Pre-Emptive Actions
- MSO Expert Panel
 - Used NEI 00-01 Rev 3 MSO List

NSCA – Non Power Operations (NPO)

- Same Process as Harris
- BNP Area Analysis Prepared
- Site Review of Strategies in Progress

Modifications

- Potential Modifications Identified
- Final Scope After Fire PRA and FSAs Completed
 - Plant Review

Treatment of Generic Issues (RAIs)

- Monitoring Program
- Defense-in-Depth Safety Margin
- Treatment of FPRA Un-Reviewed Analysis Methods
- Use of EPRI Process for Surveillance Optimization
- FPRA Sensitivity Study on CPT Factor 2

LAR Document Submittal

- Using Current Industry LAR Template
 - NEI Incorporating Generic RAIs
- Incorporating Known Lessons Learned
 - 2011 NFPA 805 Submittals
 - Current Generic RAIs

Fire PRA Overview

- BNP Overview
- Important Fire Areas and Scenarios
- Peer Review
- Current Status

Fire PRA Overview

- Methods Similar to Harris Application
 - NUREG-6850
 - Used Accepted Alternatives (eg. FAQ 08-0046)
 - RG 1.200 Peer Review Process
- Other Methods
 - The BNP FPRA Uses:
 - ✓ A Severity Factor of 0.1, Where 90% of the Fires are Contained Within the MCC
 - ✓ HRR Severity Factors are Treated Independently, Similar to Other Cabinets
 - Method was Used to Address RAI 5-32 for the HNP NFPA-805 Application

Fire PRA Overview

- Significant Efforts
 - Bus Ducts and Below-Ground Cable Ducts
 - Electrical Coordination PRA Components
 - Walkdowns and Related Documentation
- No Credit Taken for Flame Retardant
 - Installed on Thermoset Cable
 - Cable Spread Room (CSR)
 - Diesel Generator Building Basement

Fire PRA Overview

- Incipient Detection
 - Main Control Boards – Credit per FAQ 08-0046
 - CSR Area Wide – Normal Detection Credit
- Crediting Existing Solid Bottom Trays to Delay Damage
 - Per NUREG/CR-6850

Important Areas and Scenarios

- Cable Spread Room
- Control Room Abandonment
 - Detailed HRA
- Control Room
- Turbine Building
- Battery Rooms
- Switchgear Rooms

Fire PRA Peer Review

- Peer Review Overview
 - Peer Review Performed December 2011
 - ✓ 53 Findings
 - ✓ 50 Suggestions
 - Performed by Boiling Water Reactor Owner's Group per NEI 07-12 Process
 - Revised to Incorporate Findings, Resulted in Decrease in Core Damage Frequency

Fire PRA Peer Review

- Resolved 40 Findings
- Revised Calculations for F&O Resolution
- Re-Quantified for Core Damage Frequency (CDF) and Large Early Release Frequency (LERF)

Fire PRA Status

- Fire CDF Decreased Over 50%
- One Modification Credited
 - Crediting Incipient Detection in Main Control Room Cabinets (Per FAQ Guidance)
- Additional Fire Modeling
 - Diesel Generator Building Basement
 - Main Control Room
 - Cable Spread Room

Closing

- NFPA 805 Fire PRA Application Calculation in Progress
- FSAs In Progress
- LAR Submittal by Sept 30, 2012

Questions

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