

**RIC 2011
Regulatory and Industry Perspectives
on the Resolution of Fire Protection
Issues:
Harris Nuclear Plant Transition to NFPA 805**

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**NFPA 805 Transition Perspectives
Discussion Topics**

- Harris Transition Results
- Post Transition Fire Protection (FP) Program
- Remaining Challenges
- Summary of Benefits

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**NFPA 805 Transition Results
Harris Status**

- 2010
 - Safety Evaluation (SE) Received June 28
 - Program Implemented September 3
 - SE Outstanding Items Completed by December 24
 - Modifications Completed by December 31
- Triennial Inspection 3Q 2011
- Harris Transition Project Closeout 2011

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NFPA 805 Transition Results Compliance Modifications

- Most Important for Risk Reduction at Harris
 - Alternate Seal Injection Pump and Diesel Generator
 - Meggit Cable
 - Incipient Detection
 - Hemyc Upgrades
 - Thermal Shields
- Internal Events Risk Reduction
 - 1.7E-06/yr CDF and 9.0E-08/yr LERF

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NFPA 805 Transition Results Fire Watches Cleared

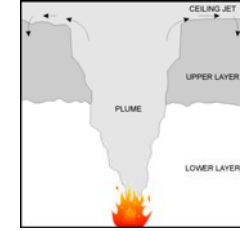
- Operator Manual Actions (OMAs) Addressed
 - Fewer Actions Needed
 - Many are Now for Defense in Depth
- Fire Induced Multiple Spurious Operations (MSOs)
 - Addressed as Part of NFPA 805 Analysis Process
- Hemyc Cable Fire Wrap Addressed
 - Limited Upgrades Required
- IN 92-18 Resolved – Spurious MOVs
 - Addressed as Part of NFPA 805 Analysis Process

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Post Transition Program Performance Based Approach

Now address potential fires on a case by case basis
Prevention program focuses on ignition sources & targets



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Post Transition Program Integration of PRA/SSA/Classical FP

- Primary Technical Elements:
 - Classical Fire Protection
 - ✓ Including Fire Modeling
 - ✓ Rad Release During Fire Fighting
 - Safe Shutdown Analysis (SSA)
 - ✓ Includes MSO / Circuit Analysis
 - ✓ Non Power Operations (NPO)
 - Fire Probabilistic Risk Analysis (FPRA)

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Post Transition Program Non Power Operations

- Fire Evaluation While the Plant is Shutdown
 - Emphasis on Periods when High Risk Evolutions are in Progress.
 - Possible Loss of Key Safety Functions (KSF)
 - Identify Fire Areas Where a KSF May be Lost (i.e. "pinch point" created)
 - Qualitative Analysis
- Compensatory Measures for Important Pre-defined Equipment Configurations

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Post Transition Program Monitoring

- Harris used an Expert Panel Process Similar to Maintenance Rule
- NFPA 805 Required SSCs Periodically Tested
- FP Systems and Features Important in the Analysis have Performance Goals Applied
 - Incipient Detection Systems, Early Warning Systems
 - Automatic and Manual Suppression Systems
 - Passive Barriers including Selected Doors, Dampers, and Drains
 - Programmatic Elements such as Transient Combustible Program, Fire Brigade (FB) Response Time

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Post Transition Program Compensatory Measures

- Under NFPA 805 Program
 - Applied to “Required Systems” (from LAR/SE)
 - Tiered Approach Depending on Importance of Impairment
 - Risk Informed via Monitoring Scoping Data
 - Reduction of Burden

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Post Transition Program Revised License Condition in Place

- Fire Protection License Condition Replaced under NFPA 805 for Plant Changes
- Risk Informed Metrics include:
 - Δ CDF and Δ LERF
 - Fire Protection Defense and Depth
- Process Uses Graded Approach to Involve Level of Evaluation Needed
- Evaluation Resources Can be Classical FP, SSA, and/or Fire PRA

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Remaining Challenges Post Transition

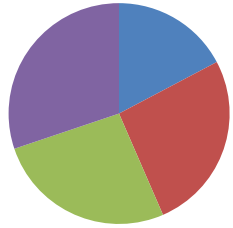
- Incorporating Fire PRA Methodology Updates
 - Metrics to Evaluate Impact on FP Program
- Inspection Process
 - NRC Pilot Inspection Procedure Expected Soon
- Timely Review of LARs and Issuance of SEs

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Remaining Challenges Complete LARs Rest of PE Plants

Average Work Effort at Crystal River, Brunswick
and Robinson



PRA = 26%
NFPA 805 Specific = 18%
Issues Resolution = 26%
Modifications = 30%

■ NFPA 805 Specific ■ Issues Resolution ■ PRA ■ Modifications

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NFPA 805 Transition Summary of Benefits

- Significant Risk Improvements
- Specific Fire Scenarios Evaluated
- Compliance Issues Resolved
 - Operator Manual Actions
 - Fire Induced Multiple Spurious Operations
 - Hemyc/MT Cable Fire Wrap
 - IN 92-18, MOV Performance
 - First Plant in Country to Resolve These Issues

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Acronyms

- PRA – Probabilistic Risk Analysis
- SSA – Safe Shutdown Analysis
- SE – Safety Evaluation
- OMA – Operator Manual Actions
- MOV – Motor Operated Valves
- MSO – Multiple Spurious Operations
- LAR – License Amendment Request
- IN 92-18 – Notice to Ensure Survivability of MOVs Susceptible to Spurious Actuation

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Acronyms

- IMPL – Implementation
- PRAI – Internal Events PRA
- PRAC - Classical Input to PRA
- PRAN – Electrical/Cable Input to PRA
- PRAF – Fire PRA Analysis
- SSC – Structures, Systems and Components
- CDF – Core Damage Frequency
- LERF – Large Early Release Frequency
- NSP – Non Suppression Probability
