NFPA 805
Industry Perspectives

December 13th, 2011

Alex Marion, Vice President
Nuclear Operations
Nuclear Energy Institute

Discussion Topics

- Where are we now?
- What is Success?
- What are Challenges to Success?
- What is Next?

Where Are We Now?

- Transition Status:
  - 48 of 104 Units Transitioning to NFPA 805
  - 2 Pilot Plant Safety Evaluations
  - Harris Has Implemented NFPA 805
  - 6 Non-Pilot LARs Submitted To Date
- Staggered LAR Submittals
- Good Interactions With the Staff

What is Success?

- Well Defined Stable Process for LAR/SE:
  - Development
  - Review/Approval
- Plant Fire Safety Improvements
- Effective Implementation
- Effective Post-Transition Processes
- Effective Use of Resources

What are Challenges to Success?

- NRC Review Costs and Schedule
- Stability in NFPA 805 LAR:
  - Preparation
  - Review Process
  - Consistency with Pilot Demonstration
- Consistency with Long Term Compliance
  - Early In Process
  - Program Maintenance and Inspections
  - Application of FPRA Insights

What is Next?

- Support Staggered LAR Review and Approvals
- More Balanced/Realistic Approach to Fire PRA
- Demonstrate compliance within a risk-informed, performance-based regulatory framework

Acronyms

- LAR - License Amendment Request
- SE - Safety Evaluation
- FPRA - Fire Probabilistic Risk Assessment
- NFPA - National Fire Protection Association

Donald C. Cook Nuclear Plant

NFPA 805 Industry Experience from Non-Pilot Plant

Presented by:
Michael Carlson
Vice President
Site Support Services

Current Status

- Submitted LAR on July 1, 2011.
- First non-pilot plant submittal.
- First submittal to rely on analysis margin vs. modifications as primary strategy.
- Completed post submittal NRC Audit November 7-10, 2011.
  - Positive NRC/Utility Interface.
  - Lower Number of LAR RAI's.

Transition Process

- Fire Safety Analysis identified the physical configuration, fire protection features, VFDRs, and Fire Risk Evaluations.
- Participation in the NEI NFPA 805 Task Force provided transition insights.
- Focused on performance-based analysis (fire modeling and risk evaluation) instead of plant modifications to demonstrate safety.

Circuit Analysis

- Circuit analysis identified two enforcement discretion issues completed in 2009.
  - Conduit wrap installation.
  - Procedure change for cold shutdown action – Use of Alternate Power Supply.
- Requires new Mods of 10 MOVs -Rewiring at Supply Breaker to include overload protection (IN 92-18).

Fire Modeling

- Modeled the NFPA 805 Fire Areas using over 900 scenarios.
- Fire Areas included one or more Fire Zones with ignition sources and target sets identified and analyzed, including the impact of transient combustibles.
- Requires re-setting of two CO2 Systems from "Isolate" to "Automatic" in the 600V MCC Area of each Unit.

Operator Recovery Actions

- Significant reduction in operator manual actions under NFPA 805.
- As part of NFPA 805 implementation, the remaining Recovery Actions will be revalidated.

Summary

- With knowledge gained with NFPA 805 fire modeling and risk evaluations, the plant is safer from the effects of a fire.
- Limited plant modifications to implement.
- Acceptable CDF & LERF Risk Success Path documented for each fire area.
- Significant reduction in operator recovery actions.

Acronyms

- CDF – Core Damage Frequency
- LAR – License Amendment Request
- LERF – Large Early Release Frequency
- MCC – Motor Control Center
- MOV – Motor Operated Valve
- RAI – Request for Additional Information
- VFDR – Variance From Deterministic Requirement

NFPA 805
Lessons Learned
Shearon Harris Nuclear Plant

December 13, 2011

Jeff Ertman

NFPA 805 Project Manager

NFPA 805 Lessons Learned Topics

- Pilot Transition
- Triennial Inspection
- Going Forward

Pilot Transition
Harris Plant

- Plant Safety Improved
- Harris NFPA 805 Program Implemented
  - 44 Modifications Completed by End of 2010
- Industry Issues Resolved - MSOs, OMAs, Raceway Wrap
- Piloted NFPA 805
  - Applied NUREG 6850

Pilot Transition Process

- Pilot Process Worked
- Transition Details Resolved
- LAR Template Set for Future Submittals
- Level of Detail in Harris SE is Reasonable
- Fire Scenarios a Key Building Block for NFPA 805 Program

2011 Triennial Inspection

- Scope Broader Under NFPA 805
  - As an Example Risk Informed License Condition Change Process
- Reasonable Use of Fire Scenario Data and Fire PRA Insights
- Considerable Effort by Site and NRC
- One Potential Finding on Procedure Development

Fire Protection Going Forward

- FAQ Process Needed For Long Term
  - Implementation Lessons Learned from Two Pilots
  - Continuing Lessons Learned from non-Pilot Plants LARs
  - Periodic Update NEI 04-02/RG 1.205
- Leverage Wealth of New Information
  - FP Program Continual Improvement
  - Inspection Program

NFPA 805 Lessons Learned

Questions?

Acronyms

- MSO – Multiple Spurious Operation
- OMA – Operator Manual Actions
- PRA – Probabilistic Risk Assessment
- LAR – License Amendment Request
- FP – Fire Protection

NFPA 805: An Industry Perspective

December 13, 2011

Paula Marino
Vice President of Engineering
Southern Nuclear
Operating Company

SNC Vision

- Sustained excellence in Nuclear Safety through performance-based/risk-informed decision making
  - Predictable and Sustainable Transition
  - Holistic Approach

Strategy

- Voluntary risk-informed applications
- State-of-the-art models and tools
- Infrastructure development

Predictable and Sustainable Transition

- NFPA-805 Challenges
  - Unclear Role of Fire PRA Peer Review
  - Duration of NRC LAR Review
  - Objectivity of Post Transition Inspection Process

Holistic Approach

- Fire PRA Model Impacts
  - Disparity between Fire PRA model and operating experience undermines holistic vision
    - Reduces overall effectiveness of risk-informed decision making
    - Delays maturity of Fire PRA methodology due to lack of usage

Path to Success

- NFPA 805
  - Predictability and flexibility
- Fire PRA
  - Realism and clarification of Fire PRA peer review role

Acronyms

- NFPA - National Fire Protection Association
- SNC - Southern Nuclear Operating Company
- LAR - License Amendment Request
- Fire PRA - Fire Probabilistic Risk Assessment

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Briefing on NFPA 805 Fire Protection

December 13, 2011

Office of Nuclear Reactor Regulation

Region II

Presenters

Marty Virgilio, Deputy Executive Director for Reactor and Preparedness Programs

Jack Grobe, Deputy Director for Engineering and Corporate Support

Alex Klein, Chief NRR Fire Protection – Lessons Learned from Pilots

Donnie Harrison, Chief NRR Probabilistic Risk Assessment – Fire PRA Lessons Learned

Rebecca Nease, Chief RII Engineering Branch 1 –NFPA 805 Inspection Program

Lessons Learned from Pilots

- Positive impact on nuclear safety
- Successful Frequently Asked Question process
- LAR template development
- Multi-disciplinary resources

License Amendment Requests

- **Staggered schedule**
  - **Effective use of resources**
- **Routine work**
- **Continuous improvement**

Acceptance Reviews

- 7 NFPA 805 LARs submitted
  - 3 formally accepted
  - 4 under acceptance review
- Consistent look with LAR template
- Spectrum of modification scope

Plants Remain Safe

- Safety enhancements
- Compensatory measures during enforcement discretion
- Inspections continue

Fire PRA Lessons Learned

- Revised RG 1.205
- Incorporated PRA FAQs into supplement of NUREG/CR-6850
- Developed/conducted training on NFPA 805 and Fire PRA
- Continuing lessons with non-pilots
  - More detailed fire modeling
  - New/refined fire PRA methods

Safety Enhancements

- **Plant procedure and physical modifications**
  - **Address fire risks**
    - **Incipient detectors**
    - **Re-routing cables**
  - **Improve overall plant safety**
    - **RCP shutdown seals/alternate seal injection**
    - **Protected service water**
- **Safety perspective improvements**

NFPA 805 Inspection Program

- **Nuclear Safety Fire Protection Inspections**
  - Tiered approach (quarterly, annual, triennial)
  - Newly issued procedure "Fire Protection–NFPA 805 (Triennial)"
  - Consistency and predictability
- **Successful Harris Inspection**
  - Training
  - Team make-up
  - Report issued and available on the public website

NFPA 805 Inspection Program

- **Lessons learned from first inspection**
  - **Inspection procedure guidance**
  - **Regulatory clarity**
  - **Inspection focus**
  - **Fire risk expertise**

- **Path forward**
  - **Oconee TFPI**
  - **No significant revisions to the program**
  - **Efficiency/effectiveness**

Summary and Conclusions

- **Enhancements to safety**
- **Predictable, consistent process**
- **Efficient and effective work process**

Abbreviations

LAR - License Amendment Request

NCV- Non-Cited Violation

NFPA- National Fire Protection Association

NRR- Nuclear Reactor Regulation

PRA - Probabilistic Risk Assessment

RG- Regulatory Guide

TFPI- Triennial Fire Protection Inspection

Before the United States Nuclear Regulatory Commission

Commission Briefing on National Fire Protection Association 805

December 13, 2011

Statement of Paul Gunter, Beyond Nuclear

Public Stakeholder Perspectives on Industry Transition to NFPA 805

INTRODUCTION

The Fukushima catastrophe raises the stakes for effectively resolving now decades old fire protection violations at operating reactors.

However, NRC and the nuclear industry are now straddled between two fire protection compliance strategies without sure footing in either.

The NRC policy of non-enforcement, otherwise known as "enforcement discretion" and the industry's excessive use of exemptions for long standing fire safety violations as a substitute for frontline fire protection from the reactor control room diminishes the agency's own defense-in-depth philosophy. These substitutes serve to obfuscate and shield the nuclear industry from violations of long standing NRC Orders issued to protect reliable control room powered operations. Furthermore, we believe that reactor operators' have misrepresented material fact to the federal agency on compliance with fire protection Orders, specifically Thermo-Lag Confirmatory Action Orders issued in 1998. A de facto agency policy of "forget and forgive" and an inability to effectively take enforcement action to move industry beyond its own financial interests leaves public safety unduly and dangerously in the lurch.

In the aftermath of Fukushima, this is not acceptable.

NFPA-805 IS STALLED ON COST, TERMINOLOGY AND DEFINITIIONS

In 2008, the Advisory Committee on Reactor Safeguards first identified that achieving fire safety compliance could be cheaper under NFPA-805 than trying to break a stalemate over the prescriptive standard.[1]

As of November 18, 2011, industry now appears to be balking on what it terms the "frighteningly high" cost associated with risk analysis and the license amendment process.

After more than 12 years of NFPA-805 development and the wrangling with industry by five different agency chairmanships, it is more frightening that the process is stalled on terminology and definitions. Moreover, the Commission's own 4 to 1 majority vote[2] this year for a protracted "enforcement discretion" policy effectively shields industry's stonewalling for a cost-cutting agenda in an apparent effort to wear down the agency staff's safety agenda.

EXEMPTIONS FROM PRESCRIPTIVE LAW TRUMP AGENCY ORDERS

Fifty-five (55) reactor units have opted to remain under a long troubled prescriptive fire code through large numbers of exemptions from law protecting control room electrical circuits for the preferred front line powered control for shutdown.[3]

Exelon's Oyster Creek nuclear power station serves to illustrate our concern for significantly diminished defense-in-depth, oversight and enforcement. It further serves to illuminate what we believe to be industry's misrepresentation of material fact for compliance with NRC fire protection Orders issued in 1998.

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[1] Transcript, Advisory Committee on Reactor Safeguards, 557th Meeting, US NRC, November 7, 2008, NRC staffer Harry Barrett, p.73, lines 10-15

[2] SECY 2011-61, June 10, 2011, http://www.nrc.gov/reading-rm/doc-collections/commission/cvr/2011/2011-0061vtr.pdf

[3] NRC 10 CFR Appendix R to Part 50 http://www.nrc.gov/reading-rm/doc-collections/cfr/part050/part050-appr.html

In part, current law requires that when control room primary and back-up electrical circuits appear in the same fire zone operators must physically protect one electrical circuit so that no single fire knocks out the preferred control room powered operation for safe shutdown.

In 1992, NRC acknowledged that a majority of US reactors were in violation of this law. In 1998, NRC had to issue Orders to 26 reactor units, including Oyster Creek, to physically protect control room electric circuits from fire damage. General Public Utility Nuclear, then owner, consented to bring Oyster Creek into compliance by December 31, 2000 for seven fire zones by removing and replacing faulty fire barrier materials and/or rerouting backup electrical circuits through a different fire zone. On January 30, 2001, Exelon, now new owner, represented by document to NRC that it had completed the corrective actions as per Order.

On January 24, 2003, NRC inspectors discovered an unprotected fire zone designated in the Order. Without notifying NRC, Exelon had abandoned corrective actions per Order and substituted unapproved manual actions that assume the safe shutdown circuitry to be destroyed by a fire and instead send workers into the plant (discounting smoke, fire and radiation) to manually pull circuit breakers, turn valves, etc. to shutdown reactor. Exelon, as much of a still non-compliant nuclear industry, was provided with protracted blanket enforcement discretion. NRC made no mention of the violation of the Order or the apparent misrepresentation of corrective safety actions to the federal government.

NRC and industry wrangled seven more years before on March 3rd, 2009, Exelon requested exemptions for dozens of fire zones from fire code and approve the use of manual actions. On March 30, 2011, following the Fukushima nuclear catastrophe, NRC approved the fire protection exemptions including six of the seven fire zones identified in the 1998 Order and confirmed by Exelon as protected.

The Fukushima disaster calls for the examination of protracted non-enforcement policy and the abandonment of front line control room powered operations.

We request an investigation and public accounting of how many reactor operators did not complete corrective actions per Order and willfully misrepresented compliance with Orders which would be a felony violation[4] of NRC law[5].

Moreover, we are sounding an alarm for the broader implication of industry compliance with future NRC Orders.

[4] USC Title 18, Part 1, Chapter 47§ 1001 Statements or Entries Generally, http://www.law.cornell.edu/uscode/html/uscode18/usc_sec_18_00001001----000-.html

[5] 10 CFR 50.9, Accuracy and Completeness of Information http://www.nrc.gov/reading-rm/doc-collections/cfr/part050/part050-0009.html