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SAFE – Non-Power Operational Modes

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Introduction

For stations whom have committed to adopt the National Fire Protection Association (NFPA) 805, A *Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants*, 2001 Edition, in accordance with 10 CFR 50.48(c).

The current industry approaches for evaluating risk during shutdown conditions involves both quantitative and qualitative assessments and is based on NEI 93- 01, *Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants*, and NUMARC 91-06, *Guidelines for Industry Actions to Assess Shutdown Management*.

It was always assumed that transitioning to NFPA 805 would require the definition and partitioning for Compartment and/or Scenarios.

Problem Statement

In the Performance Based Analysis a Compartment “full burnout” is perform for normal plant operations. The analysis should reflect the engineering resolutions associated with Normal Operational (NO) failures for the specific component in a compartment.

When transitioning to the NFPA 805 Licensing Basis, it shall be consistent with applicable FAQs, the nuclear safety performance criteria are met during Non-Power Operational (N-PO) modes.

The engineering resolution(s) applied for NO modes and those applied to N-PO modes for a failed component within the same compartment as its NO counterpart can be different and

therefore a process for applying and tracking engineering resolutions for the same component for the same compartment needs to be established.

Previous Options

Non-Power Operational modes have historically been addressed under the plant maintenance activities.

Solution

SAFE has been enhanced such that when a Performance Based Compartment “full burnout” analysis is performed, the analyst has the following options; (1) have SAFE performance the analysis using the Normal Operational mode using the Performance Based resolutions or (2) electing to run the analysis for the Non-Power Operational mode using the specific NPO resolutions.

Benefit 1

A component’s compartment’s resolutions for Performance Based and NPO can mutually exist.

Benefit 2

The SAFE analysis engine processes the desired NO/N-PO analysis.

Benefit 3

The analysis Summary and Failure reports include the analysis type that was performed.

Benefit 4

The underlying analysis model (i.e. logics) for both analysis types by design are maintained as a single model and by definition are identical.

Implementation

SAFE Version 5.0.0 has been released for safety related use in the nuclear industry

Summary

The major components of SAFE include:

- Post Fire Safe Shutdown (PFSS)
10 CFR 50 Appendix R
- NFPA 805/NUREG/ CR-6850
- Fire PRA
- Non-Power Operations

SAFE is 10 CFR 50 Appendix B compliant and was designed as a configuration management tool for long term conformance.