

**FAQ Number** 07-0038 Revision 2

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**FAQ Title** Lessons learned on Multiple Spurious Operations

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Plant: Turkey Point

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**Purpose of FAQ:**

The purpose of this FAQ is to provide updates to NEI 04-02 to reflect lessons learned from pilot plant activities, NFPA 805 task force meetings, and NRC reviews and discussions on multiple spurious operations (MSOs) [and their treatment during transition to NFPA 805](#).

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**Is this Interpretation of guidance?**  Yes / No

**Proposed new guidance not in NEI 04-02?**  Yes / No

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**Details:**

**NEI 04-02 guidance needing interpretation (include section, paragraph, and line numbers as applicable):**

NEI 04-02 Section Appendix B.2, Transition of Nuclear Safety Performance Criteria.

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**Circumstances requiring guidance interpretation or new guidance:**

Lessons have been learned from pilot plant activities, NFPA 805 task force meetings, and NRC reviews and discussions on multiple spurious operations (MSOs) [and their treatment during transition to NFPA 805](#).

**Detail contentious points if licensee and NRC have not reached consensus on the facts and circumstances:**

None.

**Potentially relevant existing FAQ numbers:**

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**Response Section:**

**Proposed resolution of FAQ and the basis for the proposal:**

See the proposed attached proposed NEI 04-02 markups.

**If appropriate, provide proposed rewording of guidance for inclusion in the next Revision:**

See the proposed attached proposed NEI 04-02 markups.

## Appendix B-2 - Transition of Nuclear Safety Performance Criteria

Add the following section to Appendix B of NEI 04-02 Revision 2

### **B.2.1.3 Fire-Induced Circuit Failures (Multiple Spurious Operations)**

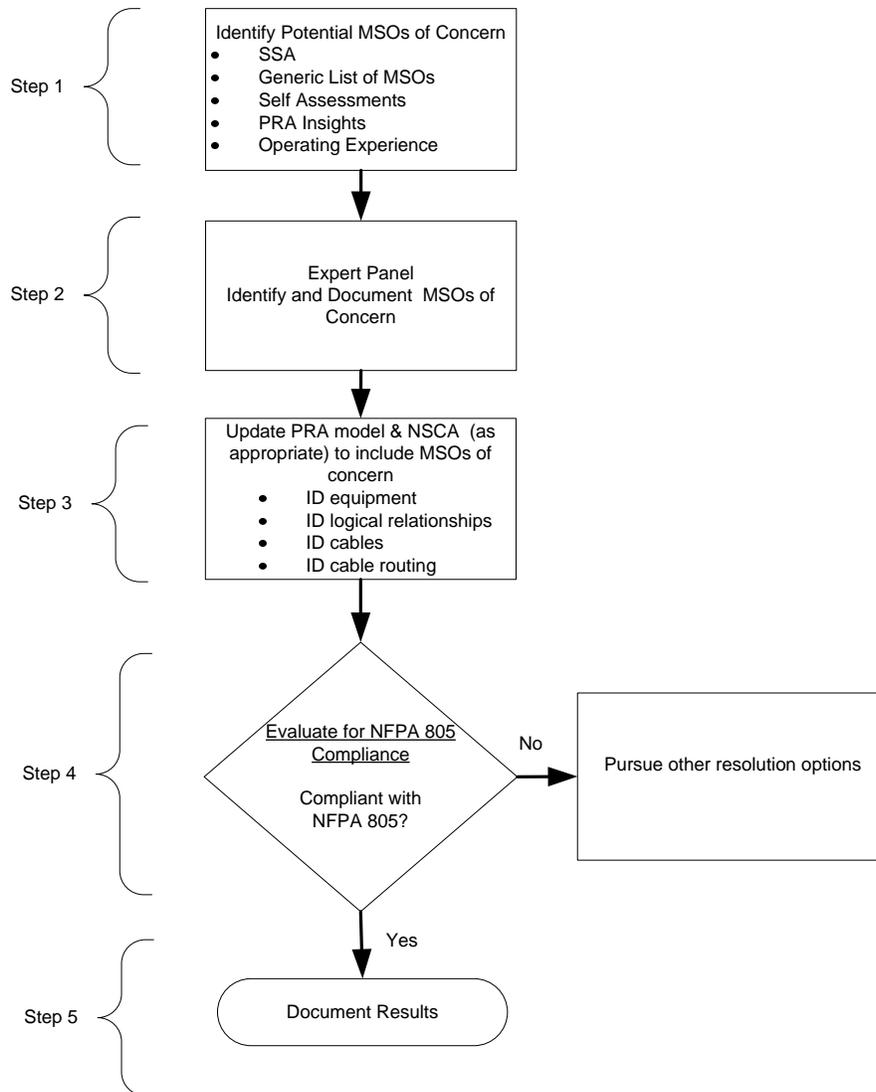
A licensee should submit a summary of its approach for addressing potential fire-induced multiple spurious operations (MSOs) for NRC review and approval. At a minimum, the summary should contain sufficient information relevant to methods, tools, and acceptance criteria used to enable the staff to determine the acceptability of the licensee's methodology. ~~The NRC staff may request additional information necessary to adequately assess the licensee's submittal.~~

The NRC staff has reviewed Revision 1 of NEI 00-01 and concluded that Chapter 3 provides an acceptable deterministic approach for analysis of post-fire safe shutdown circuits when applied in accordance with the regulatory expectations described in RIS 2005-30 and when used in conjunction with NFPA 805 and Regulatory Guide 1.205 for a plant that has transitioned to a 10 CFR 50.48(c) licensing basis (Reference: RIS 2005-30 and Regulatory Guide 1.205 Revision 01). Note that Revision 1 of Regulatory Guide 1.205 references Revision 2 of NEI 00-01, however, the technical content of Chapter 3 is essentially the same with respect to the portions related to the MSO expert panel process. Therefore, and the use of Revision 1 of NEI 00-01 Revision 1 Chapter 3 can be used as guidance for the MSO expert panel is acceptable for Chapter 3 use. In addition, an acceptable Fire PRA as defined in Regulatory Guide 1.205 Regulatory Position C.4.3 includes methods for the selection of cables and detailed circuit failure modes analysis, as well as the integration of these circuit failures into the overall Fire PRA (e.g., NUREG/CR-6850 Tasks 3, 9, 10, and 14).

The approach outlined in Figure XX below is one acceptable method to address fire-induced MSOs. This method uses insights from a Fire PRA that meets the requirements of Regulatory Guide 1.205, Revision 01.

This process is intended to be in support of transition to a new licensing basis. Post-transition changes would use the risk-informed, performance-based change process. The post-transition change process for the assessment of a specific MSO would be a simplified version of this process, and may not need the level of detail shown in the following section (e.g., An expert panel may not be necessary to identify and assess a new potential MSO. Identification of new potential MSOs may be treated as part of the plant's change review process and/or inspection process) Operating Experience process. This FAQ scope is limited to treatment of MSOs during transition to NFPA 805.

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**Figure XX – Multiple Spurious Operations – Transition Resolution Process**

### **Step 1 - Identify potential MSOs of concern.**

Information sources that may be used as input include:

- Post-fire safe shutdown analysis (NEI 00-01, Revision 1, Chapter 3)
- Generic lists of MSOs (e.g., from Owners Groups, ~~if available.~~)
- Self assessment results (e.g., NEI 04-06 assessments performed to address RIS 2004-03)
- PRA insights (e.g., NEI 00-01 Revision 1, Appendix F)
- Operating Experience (e.g., licensee event reports, NRC Inspection Findings, etc.)

### **Step 2 - Conduct an expert panel to assess plant specific vulnerabilities (e.g., per NEI 00-01, Rev. 1 Section F.4.2).**

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The expert panel should focus on system and component interactions that could impact nuclear safety. This information will be used in later tasks to identify cables and potential locations where vulnerabilities could exist.

The documentation of the results of the expert panel should include how the expert panel was conducted including the members of the expert panel, their experience, education, and areas of expertise. The documentation should include the list of MSOs reviewed as well as the source for each MSO. This documentation should provide a list the MSOs that were included in the PRA and a separate list of MSOs that were not kept for further analysis (and the reasons for rejecting these MSOs for further analysis)

Describe the expert panel process (e.g., when it was held, what analyses were reviewed to identify MSOs, how was consensus achieved on which MSOs to keep, criteria used in decision process, etc.)

[Note: The physical location of the cables of concern (e.g., fire zone/area routing of the identified MSO cables), if known, may be used at this step in the process to focus the scope of the detailed review in further steps.]

### **Step 3 – Update the fire PRA model and NSCA to include the MSOs of concern.**

This includes the:

- Identification of equipment (NUREG/CR-6850 Task 2)
- Identification of cables that, if damaged by fire, could result in the spurious operation (NUREG/CR-6850 Task 3, Task 9)
- Identify routing of the cables identified above.

Include the equipment/cables of concern in the Nuclear Safety Capability Assessment (NSCA). Including the equipment and cable information in the NSCA does not necessarily imply that the interaction is possible since separation/protection may exist throughout the plant fire areas such that the interaction is not possible).

Note: Instances may exist where update of the MSOs may not warrant update of the Fire PRA and NSCA analysis. For example, Fire PRA analysis in NUREG/CR-6850 Task 2, Component Selection, may determine that the particular interaction may not lead to core damage, or pre-existing equipment and cable routing information may determine that the particular MSO interaction is not physically possible. The rationale for exclusion of identified MSOs from the Fire PRA and NSCA should be documented and the configuration control mechanisms should be reviewed to provide reasonable confidence that the exclusion basis will remain valid.

### **Step 4 – Evaluate for NFPA 805 Compliance**

The MSO combinations included in the nuclear safety capability assessment should be evaluated with respect to compliance with the deterministic requirements of NFPA 805, as discussed in Section 4.2.3 of NFPA 805. For those situations in which the MSO combination does not meet

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~~the deterministic requirements of NFPA 805, the components and associated cables should be resolved by other means (e.g., performance-based approach per Section 4.2.4 of NFPA 805, plant modification, etc.) MSOs of concern should be included in the compliance assessment in the NSCA, consistent with the process for all NSCA components. The compliance assessment may use both deterministic and performance-based approaches.~~

The performance-based approach may include the use of feasible and reliable recovery actions. ~~During transition, if the recovery actions are deemed unallowed per the pre-transition licensing basis (Bin H for FAQ 06-0012), a risk-informed performance-based change evaluation may be used as potential means of demonstrating NFPA 805 compliance. The use of recovery actions to demonstrate the availability of a success path for the nuclear safety performance criteria requires the additional risk presented by the use of these recovery actions to be evaluated (NFPA 805 Section 4.2.4), as discussed in Section B.3.???.~~

~~Note that during the NFPA 805 transition, deterministic separation/protection is per the current licensing basis (10 CFR 50, Appendix R / NUREG 0800) with consideration of approved exemptions, etc. MSOs that meet the separation/protection requirements of the pre-transition licensing basis should be documented and the appropriate transition documentation updated as necessary.~~

~~MSOs that are not in compliance with NFPA 805 will be reviewed for other resolution options, such as plant modifications.~~

~~For each MSO having a delta CDF/LERF exceeding NEI 04-02 Section B.2.1 thresholds, provide the contribution to CDF/LERF.~~

### **Step 5 - Document Results**

The results of the process should be documented. The results should provide a detailed description of the MSO identification, analysis, disposition, and evaluation results (e.g., references used to identify MSOs; the composition of the expert panel, the expert panel process, and the results of the expert panel process; disposition and evaluation results for each MSO, etc.). High level methodology utilized as part of the transition process should be included in the 10 CFR 50.48(c) License Amendment Request/Transition Report.