Pilot Application of NEI 00-01, Draft Revision 0 (December 2008)

Dennis Henneke
GE Hitachi

Robert White
ERIN Engineering

HITACHI

Purpose

The purpose of this pilot study is to apply the methods for identification and treatment of multiple spurious operations (MSOs) prescribed by NEI 00-01 draft revision 2.

The pilot report documents the lessons learned from the performance of the pilot. These lessons learned are in the form of:

- a recommendation list of changes to NEI 00-01,
- revised generic BWR MSO list.

Steps

Screening of Generic MSO Lists:

- Applicable to the pilot?
- Already Addressed in the plant SSA?

Plant Specific Additions to the MSO list

- Review of existing SSA
- PRA input per Appendix F
- Expert Panel Review
  - Also confirms screening.

Determination of MSO Categorization (Green/Orange).

Fire Area Assessment:

- Not performed for Phase I of the pilot application.

Expert Panel Review Steps

Team Selection: See NEI 00-01 team makeup.

Training: Generic Training Package Developed.

Performance:

- Review of Generic MSO List
- Review of P&IDs and Electrical Diagrams
- Review of existing SSA MSOs
- Review of PRA results.
- Review of Multiple Combinations (see below).

Follow-up meetings

- Review of Fire Modeling or PRA screening (not performed for Phase I of the pilot application).

Results

Screening:

- ~3-4 day review by 2-3 people resulted in pre-identification on non-applicable scenarios.
- Saved time for the expert panel.
- About 1/3 of the scenarios on the BWROG MSO list were not applicable.

Results

Additions to the Plant Specific MSO List:

- Some scenarios added to the plant specific list based on existing SSA treatment.
  - Some scenarios were already treated in the SSA (i.e., power removed from MOV, manual action, etc.)
  - Some previous SSA scenarios were not addressed due to identified multiple spurious not within license basis.
- 6 PRA scenarios pre-identified, resulted in 3 scenarios added to the list (other 3 were already in generic MSO list).

Results

Additions to the Plant Specific MSO List:

- Several new scenarios identified by the expert panel P&ID review.

MSO Categorization: (Ongoing)

- Most were categorized as Orange.
- Some follow-up analysis was identified to support the categorization. Analysis may include;
  - (T-H) Analysis
  - Cable Tracing

Results

Feedback to the generic BWR MSO list:

- 4 modified scenario descriptions.
- 5 new scenarios.
- 1 split scenario.
- 15 wording clarifications.

Multiple-MSOs

Expert Panel discussed combinations of MSOs, based on revised guidance in NEI 00-01, Paragraph 4.4.3.4

Key areas identified were MSOs (or single spurious) that were screened as not failing SSD, but when combined resulted in enough flow to fail SSD.

- Scenario added: Single SRV and diversion through RWCU.
- Flow diversions in either does not fail SSD, but when combined, likely will fail SSD.

Most MSOs that were screened due to low flow would not be of concern when added together (e.g., head vents and steam drains).

The added process step adds value to the expert panel process.

Improvements to NEI 00-01

Modified BWR Generic MSO list

Revised Expert Panel process;

- Original Chapter 4 process was not presented in order, with some information in Appendix F.
- Revised process provided in order of performance.
- Single Page Checklist provided to help.

Clarifications added in several areas

- Expert Panel would not determine orange/green categorization.
- MSOs already addressed in the SSA still go on the plant specific list.

Summary

Pilot Application validated the NEI 00-01 process:

- Process works, with a resulting plant-specific MSO list based on input from multiple sources.

NEI 00-01 chapter 4 has been revised and should provide a clear process, when used.

Generic MSO list has been improved.