

Preliminary MSPI Workshop Outline

TWFN Auditorium

January 21, 2003

Purpose of the Workshop:

- **To discuss the significance of the MSPI benchmarking results, and to understand its impact on the data accuracy and pilot objectives.**
- **To discuss and understand the differences in data collected from similar plant groups and where significant differences are noted, try to understand the reasons for the differences.**
- **To discuss and identify all MSPI technical and implementation issues that impact the ability of pilot participants to accurately report data in accordance with the written pilot guidance.**

MSPI WORKSHOP AGENDA

January 21, 2003

8:00-8:30 a.m. Introductions (J. Thompson, NRR, P. Baranowsky, RES, S. Floyd, NEI)

8:30-9:00 a.m. High Level Staff Overview (Donald Dube, RES)

- See Attachment 1: Status of benchmarking, General issues related to all plants (handling of running/standby pumps, PMT demands, failure rate topics, active components)

9:00-9:15 a.m. High Level Industry Overview (Steve Floyd, NEI)

- Topics to be supplied

9:15-9:30 a.m. High Level Regional Overview (Glenn Meyer, NRC)

- Topics to be supplied

9:30-10:00 a.m. Top 5 Issues (Donald Dube, RES)

- System boundary issues
- Should common cause failures be incorporated in the MSPI model?
- Significance of very low F-V values for trains
- Support system initiators and their impact on F-V values
- Invalid indicators - significance of the false positive and false negative issues

10:00 - 10:15 a.m. Break

10:15 - 12:00 p.m. Breakout Sessions (All, split into groups of "like plants" Group discussion will be led by an NRC facilitator. Facilitators will summarize issues for reactor group presentation at 3:15 p.m. plenary session)

Breakout groups to discuss, document, and understand the issues involving:

- FV comparisons - SPAR model vs. Plant PRA (for all 6 systems)
- Implementation guidance/interpretation issues
- Invalid indicators - false positive and false negative issue
- Significant differences between like plants
- Identify remaining significant, unique plant issues

CE Plants

Millstone 2
Palo Verde 1,2,3
San Onofre 2,3

Westinghouse Plants

Braidwood 1,2
Millstone 3
Prairie Island 1,2
Salem 1,2
South Texas 1,2
Surry 1,2

BWRs

Hope Creek
Limerick 1,2

- 12:00 - 1:00 p.m. Lunch
- 1:00 - 2:45 p.m. Continue Breakout Session
- 2:45 - 3:00 p.m. Break
- 3:00 - 3:45 p.m. Breakout Session Reports (NRC & Consultants)
- 3:45 - 4:30 p.m. Improved Guidance / Action Items (All)
- Identify areas/issues to look out for
 - Top items to focus future resources
 - Activities and schedules for remaining 6 months

Some MSPI Questions and Answers

1. What MSPI specific documentation should be compiled by the licensee for purposes of this pilot?

Answer: Pilot licensees should have separately compiled and available for inspection: (1) simplified P&ID drawings of the monitored systems where the active components have been identified, (2) risk significant functions of those systems, (3) if the train/system success criteria differ from the plant's design/licensing basis, the PRA success criteria and related parameters should be listed, (4) for each active component a listing of the maximum F-V/UR value, the F-V and the UR value, and (5) for each train, the maximum F-V/UA value, the F-V and the UA value. In addition, a copy of this information should be sent to Donald Dube, RES.

Additionally, licensees should also note where they have taken exception to the NEI 99-02 Appendix F guidance. For example, some active components that meet the MSPI definition of an active component may not be modeled in the PRA or included in the MSPI calculation. Licensee should explain in writing why this exception was taken and the reason for the exclusion or omission.

By way of example, RES has found that the documentation compiled by Arizona Power for Palo Verde substantially meets the intent.

2. Do all of the success criteria for all active components need to be pre-identified in a data sheet format or do the success criteria only have to be pre-identified if it is a departure from the design basis? Also, what kind of justification for the success criteria is required?

Answer: All pilot participant licensees need to state in writing the systems' risk significant functions. If the licensee desires to use the design/licensing basis for success criteria, it must so state. A separate listing of design/licensing success criteria need not be included. If success criteria from the PRA are used, the specific success criteria must be stated in writing. Justification for the PRA success criteria will not be included in the MSPI documentation. (Note however, that justification should be available in the licensee's PRA documentation).

3. Is a statement in the IPEEE (PRA) adequate basis to determine that a component is not active for MSPI? For example, the IPEEE states that HPCI is able to perform its safety function if the min flow valve fails to close. Is that sufficient documentation to conclude that the min flow valve is not active?

Answer: The PRA should provide justification for its assumptions. It is not the purpose of the MSPI TI inspection to review the PRA. However,

inspectors' questions about PRA assumptions should continue to be documented and forwarded to NRR/RES for review.

4. Is it a requirement to assemble all assumption, back-up material, and validation (e.g., all of the Fussell-Vesely values for every basic event, calculations?) Is that what "readily available for inspection" means?

Answer: No. However, readily available means having the documentation described in Question 1 and 2 in a concise format and together and is easily accessible by inspectors. For purposes of how to document functional success criteria and other assumptions, it is adequate to state that the assumptions used by the licensee is the PRA or the design/licensing basis. All exceptions must be documented.

5. Should all of the "sub-components" in a "super-component" be pre-identified by component number and have pre-identified success criteria?

Answer: The staff expects that major active components be identified on the simplified P&ID drawings. Licensees should explain where the boundaries are for the critical sub-components (e.g., the last relay or circuit breaker, or interfacing system valve that is included in the system boundary). In general, the licensee should use its Maintenance Rule boundaries.

6. Are historical EPIX estimates an adequate source of MSPI estimates, or does there have to be a written justification for the EPIX estimates?

Answer: Yes, estimates are acceptable, without written justification, as long as they are conducted within established rules and PRA protocol. See NEI 99-02, Appendix F, page F-3 for specific guidance. For full implementation of the MSPI, current estimates (as opposed to historic data) will require justification.

7. How should EPIX estimates be converted to numbers to be placed on the MSPI spreadsheet? For example, if the EPIX estimates is for a valve to be stroked 15 times in 18 months, 15 strokes divided by 6 quarters equals 2.5 demands per quarter. Is 2.5 demands per quarter a legitimate entry since there is no such thing as a half demand?

Answer: Fractional values are ok.

8. What do you do with active components that are not modeled in the PRA? Are they required to be added to the model? By when?

Answer: Depends. If a licensee chooses not to model an active component that meets the MSPI definition of an active component, and they explain why

it was not included, it may be acceptable to not include the component. In these cases, all exceptions must be documented along with the basis for doing so. However, if the active component has a significant risk contribution, and whether or not it was modeled in the PRA, it generally should be included in the MSPI calculation. Reasons for not including the component should be discussed with the NRC regional SRA and RES. These instances will be dealt with on a case-by-case basis. Licensees will not be required to change their PRA during the pilot.

9. Guidance in NEI 99-02 says to include unit x-tie components as active components to be monitored if modeled in the PRA. No industry priors for electrical breakers were listed in Appendix F, Table 2, and breakers were not listed as a component type in the Excel spreadsheet, so they could not be added as active components.

Answer: RES will recommend a revision to Table 2 to include a generic failure rate for circuit breakers. Licensees should identify other components that may be missing from Table 2, and bring them to RES's attention.

10. Some licensees are unclear about whether to include the service water supplies to the auxiliary feedwater (AFW) pumps as active components. Some did and some did not. Plants have enough water in the condensate storage tanks (CST) to reach a stable cooled down condition, but might not have enough for the 24-hour mission time assumed in the PRA. Some assumed that the CST could be refilled but might not have the refill modeled beyond assuming that it would be 100% successful.

Answer: Sound engineering judgment could be used to exclude items such as alternate make-up to the CST. The probability of failing to make up to the CST drops significantly with time, especially as the licensee's Emergency Response Organization becomes fully staffed. For example, it would be reasonable to assume that if the time to begin refilling the CST were say 20 hours, and the required make-up rate were 200 GPM, and there were multiple paths available to provide alternate water, then this would be justification to exclude valve connections from the PRA model and the MSPI. However, a different conclusion would be reached regarding refilling the RWST in one hour following a large-break LOCA.

11. Some plants had several active components being monitored under MSPI that were not modeled in their PRAs. There was no guidance regarding how to assign appropriate F-V valves to those components. The licensees were unable/unwilling to make major revisions to their PRA models just to support the MSPI pilot. For some of the components, licensees entered a zero F-V (which made monitoring component unavailability and unreliability a waste of time) and for some they made up what they thought would be a conservative F-V value.

Answer: An arbitrarily assigned F-V of zero is not acceptable. A conservatively assigned F-V **as an interim measure** would be acceptable provided there

were adequate justification and documentation for the like. It is expected that at the next opportunity to update/revise the PRA model, that these active components would be included.

12. Most Westinghouse plant Emergency Operating Procedures have a step to close the safety injection accumulator isolation valves before depressurization and going on containment sump recirculation in order to prevent injection of nitrogen into the reactor cooling system and potentially impeding reactor cooling. Further research needs to be done regarding whether failure to close the valves could result in failure to meet success criteria for core cooling.

Answer: The closing of the safety injection accumulator isolation valves is a good practice recommended by Westinghouse but is not absolutely necessary to the successful mitigation of a LOCA. The presence of nitrogen retards condensation processes, but in and of itself would not result in core damage. The fact that a) the valves would not be closed in time to affect the accident progression during the most critical short-term (minutes) phase of a rapid large-break LOCA (and are not credited in the design basis LOCA analyses), and b) are not single-failure proof, are evidence that closing of the valves is not part of the system success criteria to prevent core damage.

13. There was no clear guidance on truncation limits for active components. If active components have a very low contribution to core damage frequency, they are not worth monitoring.

Answer: A truncation value of $1E-11$ /yr or less is recommended.

14. For systems with one pump normally running and one or more other pumps in standby (such as component cooling for many plants), guidance is needed to describe how to account for unavailability time.

Answer: Guidance will be provided for the January 21, 2003 workshop. It is safe to say that regardless of which approach is used, one must be sure to preserve a) the total CDF, b) the FV/UA for each train, especially if there are non-symmetric contributions to total CDF such as can arise when the AC and/or DC support systems are not symmetric. For example, one DC bus may provide control power for one steam-driven and one motor-driven pump, while the other DC bus powers just one motor-driven pump. In such cases, the F-V for the two motor-driven pumps will be very different owing to the relative contributions to the CDF.

15. Potential problem with following the 8 steps at the end of Appendix F for calculating planned unavailability in the baseline data: In Steps 2 and 3, fault exposure and unplanned unavailability hours are subtracted from the total unavailable hours. In Step 7, cascaded hours are subtracted. If some of the fault exposure and unplanned unavailability hours were from cascaded support systems, they could be subtracted twice.

Answer: Good point. Licensees should be made aware of this.

16. Some plants reported start demands and run times for several pumps and stroke demands for many valves that were estimated based on normal surveillance schedules and typical surveillance completion times. Verification of the data by the inspectors found several cases where the estimated data was not the same as actual demands and run times. I believe the guidance should be clarified to state that actual data is required unless it is not obtainable.

Answer: The intent is to allow for reasonable means of approximating demands to the extent possible. Differences of up to 25% between estimate and actual are recognized as being possible and would, in general, not be a reason for concern. Factors of two or more between actual and estimates would be a concern. One possible way of estimating demands is by sampling and extrapolation. For example, assume thorough counting of demands for a population of six valves in a particular system was made over a 12-month period. And assume there were no unusual changes in operation (extended outages) and no significant changes to surveillance test procedures in that time frame. Extrapolating to 24-months by doubling the number of demands for this population of valves would be reasonable.

17. Some licensees tended to report all pump start demands including, post maintenance test (PMT) starts, because it was easy to determine the number of starts for many pumps, based on charts of breaker position or discharge pressure/flow, but it took extra work to determine the reason for the start. The guidance should be clarified to state whether it is an acceptable option to report all start demands, or do PMTs have to be excluded.

Answer: Guidance will be provided for the January 21, 2003 workshop.

18. The guidance in Appendix F and other places tells the licensees to include information in the comments field of the spreadsheet for certain things like substantial changes to their maintenance philosophy and corrections to previously reported data. There doesn't appear to be a comments field in the spreadsheet.

Answer: Please look at the "NRC Data" tab in the spreadsheet. This tab presents the data and comment fields for each PI.

19. At some plants support systems are modeled for their mitigation functions only. In others, the contribution to initiating event frequency (such as reactor trips) is also modeled for the support systems. This results in different F-V values for the same system in similar plants.

Answer: Agree. This remains an open item as far as RES is concerned. Some plant PRA models include detailed initiator fault trees, which would capture the contribution of the components in question to the FV. In other cases, a straight initiator frequency for the loss of the support system is used, and the contribution to FV from the component in question is missing. This topic will

be discussed at the January 21, 2003 workshop, but closure of the issue will not occur until later in 2003.

20. The ROP web site does not have a link for submitting comments on the MSPI, nor does it have the specific MSPI comment forms.

Answer: Good point. This needs to be addressed.