

From: Ray Gallucci *NR*
To: David Diec; Mark Salley; Phil Qualls; Sunil Weerakkody *NR*
Date: 9/5/03 3:18PM
Subject: Some Thoughts on Manual Actions

In reviewing some of the Fire SDP material See-Meng Wong forwarded to me, I came across the following item from the minutes of the 8/14/02 workshop on fire SDP:

*Common rules applied in fire PRA include the following:

- No credit is taken for human actions that would require entry into, or passage through, a fire area
- If the normal access route is blocked, but an alternate exists that would allow the action while bypassing the fire area, then a degraded reliability (higher failure probability) might be assigned
- If an action is not directly impacted by the fire but occurs outside the MCR, then some degradation in the success likelihood (increase in failure probability) is generally assumed due to the heightened stress level associated with a fire event
- Actions that take place inside the MCR are assumed not to be impacted by fires outside the MCR.*

These four items seem to summarize a reasonable set of guidance for determining what and in what way manual actions might be credited and ranked in terms of feasibility for the Manual Action Rulemaking. At a minimum, it could be used as some backup material for next week's ACRS presentation. Note especially the last "rule," which seems to lend additional justification to our exclusion of in-MCR manual actions ("Operator Actions" by Mark's definition) from the MA Rulemaking.

CC: Daniel Frumkin; See-Meng Wong

N-6

August 07, 2002

MEMORANDUM TO: Michael R. Johnson, Chief
Probabilistic Safety Assessment Branch
Division of Systems Safety and Analysis
Office of Nuclear Reactor Regulation

FROM: See-Meng Wong/RA/
Licensing Section
Probabilistic Safety Assessment Branch
Division of Systems Safety and Analysis
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SUBJECT: WORKING GROUP MEETING TO DISCUSS THE IMPROVEMENT FOR
PHASE 2 FIRE PROTECTION SIGNIFICANCE DETERMINATION
PROCESS (SDP) METHODOLOGY

DATE AND TIME: August 14, 2002
9:00 a.m. - 4:30 p.m.

LOCATION: U.S. Nuclear Regulatory Commission
One White Flint North
Room 10B2
11555 Rockville Pike
Rockville, Maryland

PURPOSE: To discuss the issues affecting the Phase 2 fire protection SDP methodology, and discuss possible approaches for addressing each issue to develop improvements for the Phase 2 fire protection SDP methodology.

BACKGROUND: Under the NRC new Reactor Oversight Process, a current version of the fire protection SDP methodology (Appendix F, IMC 0609A) has been used to determine the risk significance of fire protection inspection findings. Feedback from NRC staff users indicate that the fire protection SDP can be improved to be more effective and efficient in its use.

AGENDA TOPICS: 1. Current Phase 2 Fire Protection SDP Methodology
2. Prioritization of Issues and Proposed Resolutions

*Meetings between NRC technical staff and applicants or licensees are open for interested members of the public, petitioners, intervenors, or other parties to attend as observers pursuant to the Commission Policy Statement on "Staff Meetings Open to the Public: Final Policy Statement," 65 *Federal Register* 56964, 9/20/2000. Members of the public who wish to attend should contact See Meng Wong at (301)415-1125 or SMW1@nrc.gov

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Specific Issue #8: Human actions

Human actions is a significant challenge area, perhaps the most challenging of the identified needs. Stakeholders have expressed a need for improved treatment and guidance. However, the quantitative analysis of human action is a very complex science. In the case of the fire SDP we should keep our expectations modest.

However, human actions can also be a critical aspect of the fire response procedures under a range of circumstances. Alternate shutdown and remote shutdown are the most obvious examples. Hence, we must provide for some reasonable treatment of human actions.

One aspect of a fire scenario analysis the need to identify what human actions are actually being credited. In general, identified actions are credited with a nominal reliability unless the fire itself might impact their success or failure.

Common rules applied in fire PRA include the following:

- No credit is taken for human actions that would require entry into, or passage through, a fire area.
- If the normal access route is blocked, but an alternate route exists that would allow the action while bypassing the fire area, then a degraded reliability might be assigned.
- If an action is not directly impacted by the fire but takes place outside the control room, then some degradation in the success likelihood is generally assumed due to the heightened stress level associated with a fire event.
- Actions that take place within the control room are assumed to not be impacted by fires outside the control room.

For the fire SDP we should likely focus on development of a set of rules such as those cited above. Guidance on the identification of credited human actions is needed. We should then attempt to assign numerical values corresponding to each rule that would quantify the failure likelihood under the cited conditions. Beyond the application of simple rules, HRA analysis can become quite complex and would be beyond the capacity of a non-expert.