Enclosure 2
Position Paper on HRA Methodology Outlined in the RASP Handbook

The industry found several instances where the guidance given on Human Reliability Analysis (HRA) in the RASP Handbook is insufficient to provide a necessary level of consistency in interpretation and subsequent results. Areas where the guidance given in the handbook could be substantially improved include the definition of recovery, criteria for crediting recovery, and quality requirements for HRA methods. This paper details the issues found in each of these areas, and offers potential revisions that could enhance the ability of the handbook to assist senior reactor analysts in arriving at consistent and realistic results.

Definition of Recovery

As used in Chapter 6 of the RASP Handbook, "recovery" is an ambiguous term that is not clearly defined to assist the reader in their analysis. While a definition is offered in the first sentence of Section 6.1, the definition is not clear, and the sentence uses the term "recovery" in the definition. A more comprehensive approach would be to list the different means by which recovery can be achieved, such as an emergency operating procedure step directing an action in response to an initiating event.

Criteria for Crediting Recovery

Although the amount of recovery credit given for a potential recovery action typically depends on the type of initial failure, the RASP Handbook does not explicitly discuss such considerations. A summary of examples of initial failure events and associated potential recovery in Chapter 6 of the RASP Handbook could be useful for enhancing the reader's understanding of when crediting recovery actions is appropriate.

Quality Requirements for HRA Methods

The industry is concerned about the lack of discussion in the RASP Handbook on quality requirements for HRA methods. The concern is twofold: first, HRA good practices such as independent review are not emphasized; and second, the RASP Handbook directs the analyst to use SPAR-H for modeling despite known limitations associated with that methodology. The second concern is relevant to PRA quality because of the extensive quality issues associated with SPAR-H, which are discussed in NUREG-1842*, Evaluation of Human Reliability Analysis Methods Against Good Practices*, but are not mentioned in the RASP Handbook, despite the direction to the analyst to use the methodology as opposed to others.

With respect to general PRA quality requirements, the industry is concerned that the guidance given in the RASP Handbook does not mention any independent review expectations. This is inconsistent with the implication in NUREG-1792, *Good Practices in HRA*, that because of the variability in results, independent review of the important human error probabilities is desirable. Further, although industry HRA methods undergo quality reviews such as a peer review to document compliance to the ASME PRA Standard, SPAR-H does not undergo the same peer review process. In applications such as the Significance Determination Process (SDP) where a Human Error Probability (HEP) is driving the results, the HRA portion (SPAR-H or otherwise) should undergo a RG 1.200 compliance review of that HEP. The industry suggests that the RASP Handbook be enhanced with guidelines on HRA quality reviews, as performance factor selections can vary the human error probability by as much as a factor of 50.

With respect to the direction to use SPAR-H, the industry is concerned that the reader is directed to use SPAR-H for modeling, as opposed to widely-used EPRI methods or other NRC methods such as THERP and ATHEANA. SPAR-H is a simplistic model that provides a first-order approximation of the HEP by scaling performance shaping factors (PSFs). Given the current SPAR-H modeling guidance, there is a great deal of latitude in the credit of each PSF such that the resulting HEP can easily vary by a factor of 5 or 10, and can even vary by a factor of 50. This may be sufficient for Phase-2 SDP, but for Phase-3, a more detailed approach is typically needed for a best estimate HEP. For example, in a scenario where time pressure dominates, the Timing PSF would drive the HEP if SPAR-H is used. In a more detailed approach, the time pressure may be offset by training and/or procedures if the action is well known and well practiced, or it may not be recovered at all. Such aspects of HRA are not captured in a SPAR-H analysis. The industry suggests revising this portion of the RASP Handbook to, first, allow other HRA methods to be used, and second, to caution the reader on the limitations of SPAR-H, possibly by referencing NUREG-1842, which documents these limitations.

Conclusion

While the industry is concerned that the guidance given on HRA in the current revision of the RASP Handbook is not sufficient to facilitate the achievement of consistent HRA results, some minor changes, such as allowing methods other than SPAR-H to be used and explicitly discussing limitations associated with SPAR-H, would greatly enhance the guidance given. Specifically, adding guidelines on independent review and referencing quality standards, such as the relevant portions of the ASME Internal Events PRA standard, would help assure consistency in interpretation.