February 3, 2014

MEMORANDUM TO: Those on the Attached List

FROM: Ho Nieh, Director **/RA/**
Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation

SUBJECT: INTERIM STAFF GUIDANCE TO SUPPLEMENT SECTION 8 OF THE RISK ASSESSMENT STANDARDIZATION PROJECT (RASP), (REVISION 2.0), VOLUME 1

The purpose of this memorandum is to provide NRC staff with interim guidance that clarifies RASP, (Revision 2.0), Volume 1, Section 8, regarding the use of event assessment conditional core damage probability (CCDP) in modeling the safety significance of an inspection finding that is the proximate cause of an initiating event occurrence. The interim staff guidance does not provide any new information, but rather references existing guidance in other sections of RASP, Volume 1. This interim staff guidance, as outlined in Enclosure 1 of this memorandum, will be used until RASP, Volume 1, and IMC 0308, Attachment 3, "The Technical Basis for the Significance Determination Process (SDP)," are revised. These revisions will be the outcome of policy, technical, and programmatic discussions among the NRC staff and external stakeholders via Category 2 public meetings.

Enclosure:
1. Interim Staff Guidance to Supplement RASP, (Revision 2.0), Volume 1, Section 8

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Enclosure 1

This guidance is appropriate only when the performance deficiency would always cause the initiator (i.e., there were no other performance deficiencies or atypical plant operational states that contributed to the initiation of the event).

Interim Staff Guidance to Supplement RASP, Volume 1, (Revision 2.0), Section 8:

After calculating an initiating event CCDP (as described in sections 8.2, 8.3, and 8.4) estimate the probability of not restoring the lost function during the mission time in order to sufficiently evaluate the overall safety significance of the initiating event occurrence caused by the inspection finding (see RASP, Volume 1, Section 6, "Modeling Recovery and Repair" and Appendix A, Step 4, page 118 "Modeling initiating event recovery actions" for more detailed guidance). As is the case for all at-power SDP evaluations, any SSCs not affected by the finding remain in their nominal state (e.g., baseline failure probabilities, average test and maintenance unavailabilities).

Basis for Crediting Functional Restoration from an Initiating Event:

If the mission times for all the SSCs used to mitigate the initiating event of interest are 24 hours, then the initiating event CCDP is effectively capturing the risk associated with initiating event occurrence and the probability that the mitigating SSCs will fail during that 24 hour mission time. The core damage probabilities (conditioned upon the initiating event occurrence) for all the event tree sequences that result in a core damage end state are summed up and the result is an event assessment CCDP. However, if the lost function caused by the finding and associated initiating event occurrence can be restored during the mission time, the overall risk should be less. In addition, depending on the nature of the finding and how it caused the initiating event, the sequence mission time(s) could be less (or more) than 24 hours (See RASP, Volume 1, Section 4, "Mission Time Modeling"). For example, during a loss of main feedwater (LOMFW) initiating event, the normal at-power decay heat removal function is lost. Depending upon the nature of the finding and how it caused the LOMFW initiating event, restoring the main feedwater function during the mission time (assume 24 hours) may or may not be feasible. If the finding resulted in tripping the operating MFW pump but any of the MFW pumps could be quickly started with all flow paths available, it seems reasonable that accounting for the restoration of the main feedwater function during the mission time is appropriate. However, if the finding resulted in a complete loss of main feedwater such that none of the MFW pumps could be started and/or no flow paths were available without a complex and time consuming repair/recovery effort, it seems reasonable that accounting for the restoration of the main feedwater function during the mission time is not appropriate.

The amount of credit given to restoring the lost function will obviously need to take into account the specifics of the finding and how the finding caused the initiating event occurrence. RASP, Volume 1, Section 6, "Modeling Recovery and Repair," provides additional guidance to the senior reactor analysts (SRAs) in modeling the probability of not restoring the lost function during the mission time. Some SPAR models account for the restoration of some lost functions in the nominal case. For example, the LOMFW and loss of condenser heat sink (LOCHS) initiating event trees have a recovery top event (e.g., power conversion system recovery for BWRs and secondary system recovery for PWRs). Some of the SPAR models have these basic events set-up such that they do not provide a quantitative effect in the nominal model (i.e., the basic events' non-recovery probability is "true", which effectively does not give any credit for recovery). Since the non-recovery logic is modeled as a top event in these event trees, a risk analyst is able to modify the basic event non-recovery probabilities to give additional credit if appropriate. As stated in Section 6 of RASP, Volume 1, there are many other ways to model the restoration of the lost function (e.g., fault trees, sequences, cut-sets, etc.).

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