Revision to Guidance Documents for Initiating Events Analyses

1) IMC 308 Attachment 3, Section 8
2) RASP Handbook, Vol. 1, Section 8

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OBJECTIVE

- Inform stakeholders on NRC staff rationale to use Incremental Core Damage Probability (ICCDP) in assessing the significance of licensee performance deficiencies that cause Initiating Events (including transients with complications)

  - Provide rationale for NRC staff position
  - Provide NRC staff disposition of key industry comments

Significance Determination Process

- **Primary Objective of SDP**

  - ➢ Estimate the increase in annualized CDF/LERF due to identified licensee performance deficiency that resulted in plant degraded conditions, and/or increase in Initiating Event (IE) frequencies above those assumed in the baseline annualized CDF models

- **Two Types of SDP Assessment**

  - ➢ Degraded Condition Assessment
  - ➢ Initiating Event Assessment

Rationale for NRC Approach

- NRC staff has been using ICCDP (or annually averaged ΔCDF) to assess significance of Degraded Conditions

- NRC staff is providing clarification on the use of ICCDP (or annually averaged ΔCDF) to assess significance of licensee performance deficiencies that cause initiating events (IEs)

  ➢ Differences in opinion on how to calculate IE frequency for an event that was caused by a licensee performance deficiency

- NRC approach is consistent with other Reactor Oversight Process (ROP) documents

Incremental Conditional Core Damage Probability (ICCDP)

- **Degraded Condition Assessment**
  - Use Incremental CCDP (ICCDP) as the (difference between the CCDP and the baseline CDP over a specified exposure time.
  - Equivalent to risk increase between the annualized degraded condition CDF and baseline CDF, or delta CDF per year

- **IE Assessment**
  - If IE occurred, the IE frequency is changed to 1.0 event per year, or probability of 1.0 in the given year with other IEs being set to probability of zero
  - Incremental CCDP is change in CDF per year by multiplying the change in IE frequency from baseline IE frequency by the CCDP for the affected IE

Industry Concerns

- **<u>Concern:</u>** Use of ICCDP is overestimation of SDP results

  - ➤ NRC staff views

    - For IEs caused by performance deficiencies, NRC staff uses an event frequency of 1.0 per year to estimate ICCDP (resulting in the industry perception of overestimation)

    - Some industry representatives propose using Bayesian updating of IE frequency estimates. This approach significantly "dilutes" the significance of the event

      - ❖ NRC staff does not agree with Bayesian updating approach since events caused by performance deficiencies may not have applicable generic data for evaluating past performance

      - ❖ Note: SDP is intended to capture the additional risk imposed on public due to the IE occurrence. Some industry representative consider that Bayesian updating method is appropriate since SDP should consider risk "going forward." This is contrary to the fundamental principle that SDP is a retrospective assessment of risk

Industry Concerns
(Continued)

- <u>Concern:</u> Use of CCDP constitutes a Change in Policy for SDP Implementation

  - ➢ NRC staff views

    - Assessments on degraded conditions and/or IEs due to licensee performance deficiency are part of holistic approach to assess increases to the facility's baseline risk

    - Plant transients with loss of mitigating functions require detailed risk evaluations in accordance with IMC 609 Appendix A, Exhibit 1

    - IMC 305 acknowledges that some IE findings may have the same underlying cause of IE Performance Indicators in the Action Matrix, and provide guidance not to double count performance metrics

Industry Concerns
(Continued)

- <u>Concern:</u> Only Performance Indicators were Intended for Assessment of Initiating Events.

  - ➢ NRC staff views

    - IMC 609 Appendix A Exhibit 1 does NOT screen out plant transients with loss of mitigating functions

    - IMC 305 acknowledges that some IE findings and PIs may have the same underlying causes, but the different performance metrics are NOT double counted in the Action Matrix