

A Discussion on Unmitigated Accident Scenario Modeling and Assumptions

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The assumptions and evaluations of the likelihood and consequences of unmitigated accident scenarios for hazard and accident analyses are quite different throughout the DOE complex. The assumptions made with respect to such evaluations often credit controls a priori without consideration of the fundamental objective of evaluating unmitigated accident scenarios.

Assumptions are often based on the existence of passive controls being in place, the low frequency of such postulated scenarios (i.e., screening of such scenarios based on frequency criteria of $<10^{-6}$ /yr or similar arguments), or other pre-conceived understanding or interpretation of what an unmitigated accident scenario should be.

This paper presents a discussion of the different approaches to unmitigated accident modeling and assumptions seen throughout the DOE complex based on the author's experience in writing and reviewing many authorization basis documents (e.g., SARs, Sas, BIOs, EIS, EA, etc.). Topics include:

- Discussion of the intent of DOE Standards and policy regarding evaluation of unmitigated accidents
- Approaches and assumptions for estimating unmitigated accident scenario frequencies and consequences in hazard and accident analyses
- How unmitigated accident scenario evaluations affect the selection of safety systems, structures, or components (SSCs).

This paper concludes with recommendations for estimating the unmitigated accident and consequences.