

Chemical Perspectives DOE-STD-1189

Presentation at EFCOG SAWG
Workshop
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Background

- Concerns voiced during development process for DOE-STD-1189 on how chemicals should be treated.
- Chemicals are hazards in our nuclear facilities that are required to be addressed
- Concern was focused on:
 - Maturity of analysis techniques
 - Availability of industry codes and standards that could be applied to DOE facilities
 - Precedence of requirements (nonnuclear facilities vice nuclear facilities)



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Chemical Hazard Evaluation

- DOE-STD-1189 Appendix B
- “Consistent with practice in nonnuclear hazardous facility design, DOE is not invoking classification of safety SSCs or specifying nuclear design requirements based on chemical hazards alone.”
- Guidance provided, however, in terms of advisory criteria for consideration of Safety Significant designation
- Guidance for SS designation based on:
 - Screening chemicals to determine those that may have potential to immediately threaten or endanger collocated workers or public
 - Evaluating the severity of potential exposures against advisory classification criteria for collocated workers and the public
- Additional guidance for evaluation of chemical hazards is addressed in Appendix C.



Screening Process

- Hazardous material screening to include all chemicals with known or suspected toxic properties
- Exclusion Criteria
 - Chemicals with no known or suspected toxic properties
 - Materials distributed and used by the general public
 - Chemicals “easily and safely manipulated by one person” in accordance with provisions of 29 CFR 1910.1450(b).
 - Materials with NFPA 704 health hazard rating of 0, 1, or 2
 - Solid or Liquid material that do not present an airborne hazard
 - Chemicals defined as a Standard Industrial Hazard for which national consensus standards provide for safe design and operation



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Screening Process

- Further analysis required for:
 - Chemicals with NFPA 704 health hazard rating of 3 or 4 in quantities greater than a quantity that can be “easily and safely manipulated by one person” [29 CFR 1910.1450(b)].
 - Chemicals without an assigned health hazard rating in quantities greater than a quantity that can be “easily and safely manipulated by one person” [29 CFR 1910.1450(b)]



Public and Collocated Worker Protection Criteria

- Public
 - Exposure > AEGL-2/ERPG-2/TEEL-2
- Collocated Worker
 - Exposure > AEGL-3/ERPG-3/TEEL-3



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Chemical Exposure Estimation

- Guidance provided in Appendix B
- Based on peak air concentration at receptor location at any time during the duration of release
- Complexity of evaluation significantly greater than normal radiological consequence evaluation
- Toolbox codes exist (ALOHA, EPICODE)
- Additional information available through the Subcommittee on Consequence Assessment and Protective Actions (SCAPA) Chemical Mixtures Working Group

