

Information Bulletin

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Title: Safety Basis Inadequacies Detract from Nuclear Facility Safety

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Lessons Learned Summary: Operating within an approved safety basis is a primary tenet of safe facility operation. Inaccuracies in that key document detract from our ability to safely operate a nuclear facility, potentially putting our workers and the public at risk.

Discussion of Activities: This report summarizes seven events related to safety analyses. More details about each event can be found in the references listed respectively at the end of this bulletin.

1. Failure by melting of cans holding metallic plutonium (Pu) was not considered in the accident analysis for the Plutonium Finishing Plant (PFP). Failure by over pressurization of cans holding Pu oxide was adequately analyzed, however. The hazard analysis, as it was developed, assumed the limiting condition to be a plutonium oxide over pressurization accident in a fire.
2. The Plutonium Reclamation Facility (PRF) Safety Basis fire accident analysis underestimated the potential contamination release if the facility exhaust HEPA filters plug with soot during a fire because it does not recognize that the supply fans could continue to run.
3. The Safety Basis accident analysis for Bldg 242-Z assumes confinement by ventilation but plugged ventilation exhaust prefilters have degraded flow to the point where confinement may no longer be adequate during some accident scenarios.
4. The Safety Basis for 2736-Z did not consider the accident consequences of a ventilation damper potentially failing open along with an open emergency exit. The credited passive confinement function of the building structure could be breached if people open the emergency exit while Room 641 is pressurized.
5. The Building 241-Z Documented Safety Analysis (DSA) did not adequately analyze the potential for fires involving uncontained transuranic (TRU) waste in areas without credited filtered ventilation or confinement features. The initial USQ screening for the Building 241-Z closure project did not identify combustible material hazards in containment tents around 291-Z.
6. The casing on well 299-E24-1 undergoing decommissioning was perforated using 40 explosive charges instead of the 20 authorized in the hazard analysis for that operation. The hazard analysis was prepared to inform an adjacent nuclear facility of the hazards. Preparers only loosely followed the guidelines in Site procedure HNF-PRO-8366, "Facility Hazard Categorization". Thus the analysis did not meet the level of rigor for a normal hazard analysis.
7. Hazards associated with a fire involving vehicle fuel in the FFTF Reactor Service Building (RSB) during Cask Loading Station (CLS) operations had not been considered in the Fire

Hazards Analysis (FHA) or the Final Safety Analysis Report (FSAR).

Analysis: In cases 1, 4, 5, and 7 unknown hazards or failure modes were not analyzed. In cases 2, 3, and 7, conditions changed over time or were different from those analyzed but had not been recognized as being outside the documented safety analysis (DSA). In case 6, operations were conducted outside the approved analysis. In case 7, supporting documentation for the existing safety analysis developed 25 years ago did not provide enough detail to demonstrate that hazards from vehicle fuel were analyzed and bounded by other accident analyses.

Recommendations:

Peer reviewers must diligently and independently review those documents, challenging all assumptions and verifying all calculations.

Facility personnel must be familiar with their safety basis and be continuously alert to changing conditions that may challenge assumptions on which accident analyses are based.

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References: Occurrence reports:

EM-RL--PHMC-PFP-2005-0032
EM-RL--PHMC-PFP-2005-0025
EM-RL--PHMC-PFP-2005-0030
EM-RL--PHMC-PFP-2005-0031
EM-RL--PHMC-PFP-2005-0022
EM-RL--PHMC-GRP-2005-0003
EM-RL--PHMC-FFTF-2005-0007