



Safety in Design – *Implementation Considerations*

1. Projects in progress at 1189 Implementation
2. Institutionalizing the Major Modification determination
3. Setting a “reasonably conservative” basis for analysis and controls
 - “...selecting early, design-phase safety SSCs using reasonably conservative principles...”
4. Design Execution @ Hazard Analysis baseline vs. High

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1. Projects in progress at 1189 Implementation

- Working to the “Implementation of Environmental Management (EM) Interim Guidance on Safety Integration into Early Phases of Nuclear Facility Design”, as an indicator of considerations for STD 1189 implementation:
 - Projects in progress to the point of imposing IG or 1189
 - <CD-2; >CD-3, intermediate
 - DSA significant changes (e.g. Upgrades) for dose consequence methodology

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2. *Institutionalizing the Major Modification determination*

- 10CFR830 “Major Modifications”
 - Developed a Major Modification / PDSA Determination procedure, based on the draft language in 1189
 - Local DOE concurrence
 - Have 13 projects on the list that qualify today
 - About 100 on full list (nuclear & non-nuclear)
 - Have done full determination evaluation on 25

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3. *Setting a “reasonably conservative” basis for analysis and controls*

- **Conceptual Safety Design Report (CSDR)** – ... form a reasonably conservative basis to proceed to preliminary design. ..
- **STD 3009: Unmitigated Release Calculation.** .. physical release potential of a given process or operation is conservatively estimated.
The unmitigated release .. physical realities of the accident phenomena at a given facility or process. ... define a meaningful scenario, but which also impact the magnitude of the resultant consequences.
- Early definition of scenarios still need to be meaningful – consider in light of desire to have conservative Safety Systems in the design planning.
 - e.g. is it meaningful to postulate full boiling release of tank of high activity waste; or full rupture and release of robust containers, etc. driving SC ACVS and/or fire suppression?

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4. *Design Execution @ Hazard Analysis baseline vs. High*

- **Safety Interface Requirements:** ... project and design progression might cause the SSC designation to evolve. .. evolving cost and schedule baseline projections for the project, either explicitly (as part of projections for the evolving baseline design) or as an explicit contingency on those projections if they are not included in the baseline design.
- Developing the risk and opportunities assessment is especially important at the conceptual design stage. ... The addition of opportunities is deliberate ... A conservative posture at the equipment level can sometimes be found later in design to be unnecessarily conservative and lead to avoidable costs. For this reason, opportunities are intended to capture that possible outcome in addition to opportunities for addressing risks in general
- So:
 - Set a project baseline that derives straight from hazards analysis, add Risk / contingency to adjust design up if required as design matures; or
 - Assign High controls, high cost, design to that as a baseline, add Opportunities to intentionally plan project execution to address possible downgrades in cost and schedule.
 - Either is tough if past CD-1, so rigorously imbed the R&O in the project planning.