NRIC National Reactor Innovation Center

Introduction to GDE-987, MFC Design Review Criteria and Expectations

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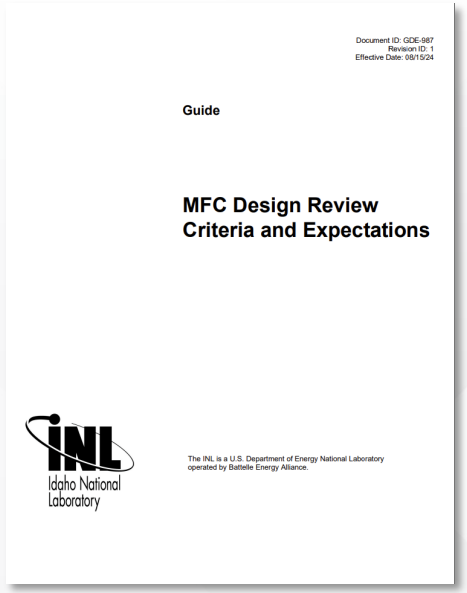
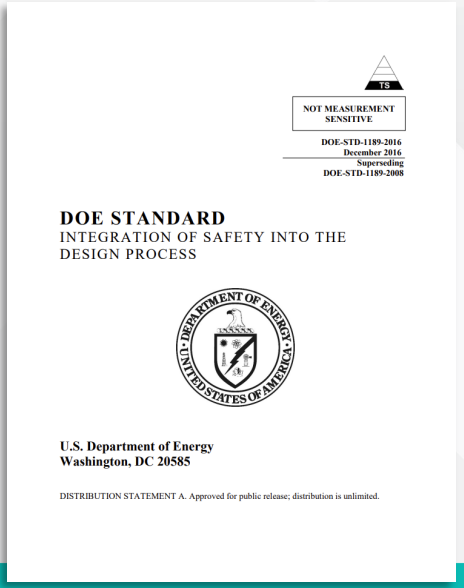
Purpose of GDE-987

- Establish criteria and expectations for milestone design reviews on large projects
- Allows for a tailored approach with agreement by Technical Integrator and Project Manager
- Translate DOE-STD-1189, *Integration of Safety into the Design Process*, to INL requirements





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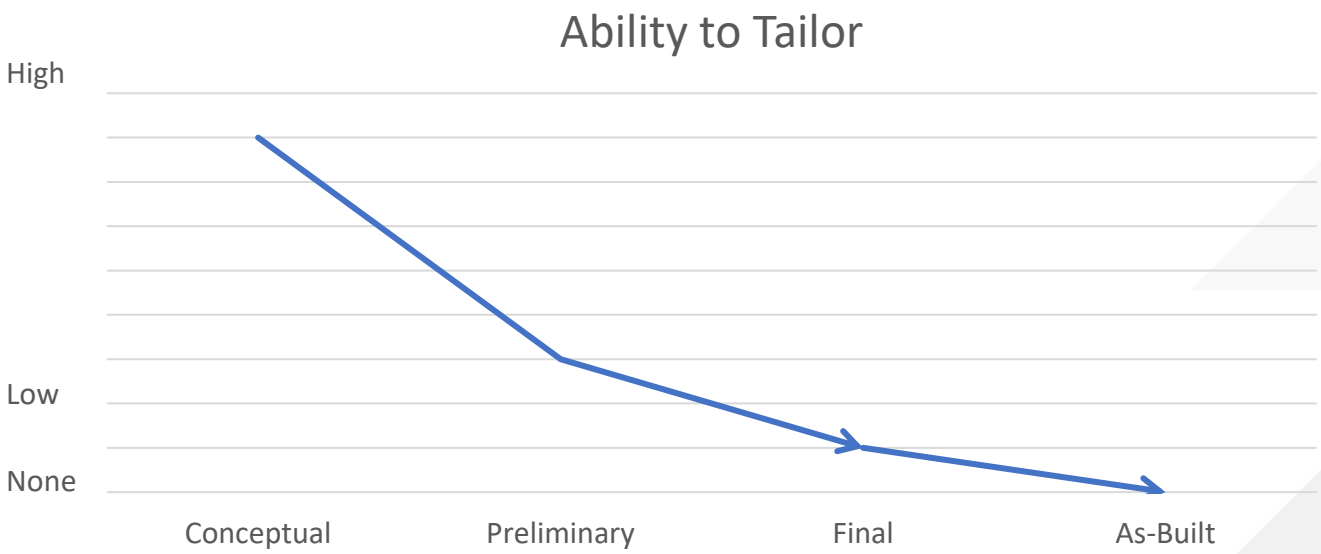
Defining the Design Review Milestones

Design Phase	Definition	Major Deliverables	Alternates
Conceptual	• Alternatives are evaluated in detail to identify the preferred approach preliminary design • Determine approach best suited for safety-in-design integration, technology readiness, type of facility, site location, security, constructability, and operability	• Safety Design Strategy (SDS) • Conceptual Safety Design Report (CSDR) • Code of Record	30%, Preliminary
Preliminary	• Hazards and accident analyses are completed at the facility level, and facility level safety functions and safety SSCs are identified. • Completion of design-to baseline	• Preliminary Safety and Design Results (PSDR) • Supporting engineering analyses, specifications, and drawings	60%, Detailed
Final	• A level capable of supporting procurement, construction, testing, and operation (i.e., design is complete)	• Preliminary Documented Safety Analysis (PDSA) • Complete drawings and specifications	90%, Final

In DOE-STD-1189 terminology, the 100% design reflects the final, as-built condition of the facility and is outside of the scope of GDE-987.

Design Review Timing

- Need advanced planning to ensure proper support
- For each design review milestone, guidance includes:
  - Entrance criteria
  - Review success criteria
- When the above are agreed upon, a design review is held with materials provided to stakeholders in advance
- Materials for review should be provided 2 weeks in advance of review. Subject to the number and complexity of comments, INL targets formal comment response 2 weeks after review.



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Design Review Format

- System Overview
  - Purpose of system and requirements review
  - Review of functions and physical layout
  - Describe interfaces with existing complex
- Concept of Operations
  - How the system will be utilized
  - Order of operations through project lifecycle
- Sub-System Reviews
  - Detailed review of requirements, options, criteria, and justification
  - Key interfaces and dependent interfaces
- Comments and action items collected, classified, reviewed, and approved
- Design Review Report generated

Design Review Action Items

Class	Definition	Examples
1	Critical action items that are required to be closed before the technical review or audit can be closed out.	Fatal design flaws, long-lead items, critical path items, or key decision points
2	Not required to be closed to close out the design review and are for future incorporation or consideration.	Items to satisfy design, programmatic, and compliance requirements, design improvements, enhancements, or recommendations
3	Lowest tier of action items; not required to be closed to close out the design review.	Editorial to improve quality, clarity, and accuracy, duplicate action items or otherwise declined

At final design, all unresolved action items should be low technical, cost, and schedule risk

Open items should not be used as a substitute for incomplete design and analysis at the time of PDSA submittal.

Supplemental INL Guidance for Developers

- GDE-987 Appendix, Design Review Deliverables and Maturity Guidelines
  - Includes relevant DOE codes, standards, and handbooks, along with associated INL standards and templates
- GDE-987 Appendix, Supplemental Deliverable Guidance and Expectations
  - Includes deliverable elements where INL templates do not exist
- GDE-55086, NRIC DOME Test Bed Users Guide
- PLN-7053, Advanced Reactor Confirmatory Analysis Plan
  - Documents INL's approach on confirmatory analyses of first of a kind reactors

Key Tasks

- Master Document List (MDL)
- Scheduling
- Tailoring as Applicable
  - Best Practice – Maturity Matrix

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