



**DOE-STD-1104-2014,
*Review and Approval of Nuclear
Facility Safety Basis and Safety
Design Basis Documents***

**Changes to DOE-STD-1104 and
Expectations for Effective Implementation**



Roll-out Contacts

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Thanks to Many Contributors

(And there were more than these...)

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Objectives

- Understand the history and drivers for changes in DOE-STD-1104-2014
- Understand the major differences between DOE-STD-1104-2009 and DOE-STD-1104-2014
- Understand key requirements of DOE-STD-1104-2014 and expectations for effective implementation





Drivers of Recent Changes

- Experience and Lessons Learned from years of use of DOE-STD-1104
- DOE O 420.1C, *Facility Safety* (12/4/2012)
- Revision of DOE-STD-3009-2014 (11/12/2014)
- DNFSB Recommendation 2010-1, Issued October 2010, and associated DOE 2010-1 Implementation Plan (9/26/2011)
 - Revise **DOE-STD-1104** to formally establish requirements for DOE federal review of DSAs.





Drivers of Recent Changes (Cont.)

▪ DOE IP 2010-1, Regulatory Options Paper (Sect. 6.5)

SOE Decisions (10/18/2014 Letter, Moniz to Winokur):

- *No Changes to 10 C.F.R. 830,*
- *Invoke revised DOE-STD-1104 as required method in DOE O 420.1C,*
- *Apply revised DOE-STD-3009-2014 via change to DOE O 420.1C to:*
 - (1) new facilities,*
 - (2) major modifications to existing facilities, and*
 - (3) existing facilities with mitigated dose estimates over the EG*





History of Revision Development

- **Project Justification Report Approved – February 2013**
- **Draft DOE-STD-1104 into RevCom – December 2013**
- **SOE Letter on Reg. Options Approved – October 2014**
- **DOE-STD-3009-2014 Approved – November 2014**
- **DOE-STD-1104-2014 Approved – December 2014**
- **DOE O 420.1C Page Change Approved – Imminent**





Implementing Requirement

- DOE O 420.1C, Page Change (approval imminent)

Section 4: “REQUIREMENTS. DOE must ...

i. Review and approve safety basis and safety design basis documents in accordance with DOE-STD-1104-2014, Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents.”

Section 5.d: RESPONSIBILITIES. Heads of Field Elements.

(13) In accordance with DOE-STD-1104-2014, review and approve safety basis and safety design basis documents.





DOE-STD-1104-2014

Document Types For Review

Nuclear Facility Safety Basis Documents

(Key Driver: 10 C.F.R. 830)

DSA (all types)

TSRs

USQ Procedure

JCO and ESS

Downgrade to < HC-3

Safety Design Basis Documents

(Key Driver: DOE-STD-1189-2008
per DOE O 413.3B and O 420.1C)

SDS

CSDR

PSDR

PDSA (also 10 C.F.R. 830 requirement)





DOE-STD-1104-2014

Core Requirement

- **“The SER for a given facility or operation shall document [Section 7.1, paragraph 10, page 30]:**
 - (1) the conduct of an appropriate review of the safety basis document (e.g., PDSA, DSA, or TSRs);**
 - (2) the bases for approving these documents (see Sections 4, 5, and 6 of this Standard for approval bases for different safety basis documents); and**
 - (3) any conditions of approval.”**





DOE-STD-1104-2014

Major Changes to Requirements

- NEW** ■ Establishes Evaluation Requirements and Approval Levels for facilities over the EG,
- NEW** ■ Establishes requirement that at least one member of the SBRT meets the requirements of DOE-STD-1183-2007 (*Nuclear Safety Specialist*)
- NEW** ■ Requirements added related to approval of USQ procedure, JCO and ESS, downgrades to below HC-3 facilities (for final hazard cat. only), and SDS.
- Removed requirement statements that duplicated 10 C.F.R. 830 or other higher-level sources, and ones that were unnecessary or rhetorical.





DOE-STD-1104-2014

Major Changes to Approval Bases

NEW

- Additions and Clarifications to the Bullets in Section 4.3, Hazard and Accident Analyses, to reflect DOE-STD-3009-2014

NEW

- Addition of a Defense-in-Depth Basis of Approval

NEW

- Significant Changes to Bases of Approval for TSRs

NEW

- Addition of Bases of Approval for USQ procedure, JCO and ESS, downgrade to below HC-3 facilities, and SDS





DOE-STD-1104-2014

Exemptions and Equivalencies

- “Alternate DSA Methods” are processed per DOE-STD-1083-2009; applies when DSA safe-harbor method is not followed completely
- Although not discussed in DOE-STD-1104-2014, O 420.1C exemptions and equivalencies may be sought on STD-1104 requirements
- DOE-STD-1104 review of design requirements does not constitute a DOE O 420.1C exemption





DOE-STD-1104-2014

Structure of the Standard

1. Introduction
2. Applicability and Scope
3. Management & Coordination of Safety Basis Reviews
4. Approval of DSAs
5. Approval of TSRs
-  6. Approval of other Safety Basis Related Documents
7. Safety Evaluation Reports
8. Safety Design Basis Documents

[Note: DOE-STD-1189-2008 is under revision]





DOE-STD-1104-2014

Review Process

- **Safety Basis Approval Authority (SBAA) – PSO** delegation to SBAA and qualifications per DOE O 450.2
- **Safety Basis Review Team (SBRT) Leader**
- **Review Plan**
- **Review Team Members**
- **Issue Resolution – i.e., normal management chain, SBAA** makes the final decision, minority opinions/dissenting views documented in the SER record, Differing Professional Opinions per DOE O 452.2
- **Graded Approach**

[Note: STD-1104-2014 Section numbers in upper right box.]





Approval Bases for DSA

- **Base Information – No significant changes**
- **Hazard Analysis/Accident Analysis**
 - More emphasis on appropriateness of Hazard Analysis methodology (e.g., techniques, inputs, assumptions)
 - Inclusion of co-located worker
 - Clarification of Accident Analysis review criteria (source term assumptions, use of PRA, dispersion modeling protocol, mitigated analysis results, planned operational improvements, Beyond DBA)
- **NEW Defense in Depth – Adequacy of layers of controls**
- **Safety SSCs – added review criterion on system evaluation**





Approval Bases for DSA (Cont'd)

- **Specific Administrative Controls – Additional review criteria consistent with Safety SSC bases**
- **Derivation of TSRs – No significant change**
- **Safety Management Programs – New criteria on key characteristics of programs per hazard analysis**
- **Existing Facilities with Mitigated Offsite Consequence Estimates Over the EG – New approval bases for all safe harbor methods based on corresponding DOE-STD-3009-2014 requirements**





NEW





Approval Bases for TSRs

- Significant revision of TSR approval bases
-  ▪ **TSR Consistency with DSA – Linkage to essential elements of DSA controls and SER (i.e., Conditions of Approval)**
-  ▪ **TSR Consistency with DOE G 423.1-1**
 - Review criteria tied to six primary TSR sections (i.e., Use and Application, Safety Limits, LCS/LCOs, Administrative Controls, Design Features, and Bases Appendix)



Approval Bases for “Other SB Related Documents”



NEW

- **USQ Process – Approval via SER or letter with approval basis linked to DOE G 424.1-1B expectations**
 - USQ Procedure
 - ESS
 - JCO

NEW

- **Facility Hazard Categorization Downgrade to “Below Hazard Category 3”**
 - Final hazard categorization guidelines in NSTP 2002-2
 - Graded review criteria commensurate with DSA approval bases
 - Clarification on downgrades related to gross inventory changes





Approval Bases for Safety Design Basis Documents

NEW

- Review Bases for SDS in Section 8.3 – Review documented in SVR or letter (with attached basis for approval)

- No significant changes to Safety Design Documents or PDSA review criteria
 - Minor formatting changes
 - Updated DOE O 420.1C reference
 - Likely to be updated after DOE-STD-1189-2008 revision is complete (est. 2016)





DOE-STD-1104-2014 Roll-Out Summary

- DOE-STD-1104-2014 is the required method for DOE review and approval of both safety basis documents and safety design basis documents.
- The revised STD-1104-2014 provides clarified and expanded requirements for preparing SERs and other DOE approval documents
- New review criteria for other safety basis related documents (e.g. USQ documents, SDS, final hazard categorization downgrades)
- We want your feedback and questions.
- Questions?

