



## Department of Energy

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### JM CHRONOLOGY

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MEMORANDUM FOR: INGRID KOLB  
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THROUGH: KEVIN T. HAGERTY  
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SUBJECT: Notice of Intent to Revise Department of Energy Order 420.1B,  
*Facility Safety* and its Implementing Guides

**PURPOSE:** This memorandum provides background and justification for revision of Department of Energy (DOE) Order 420.1B, *Facility Safety* (Chg. 1, 04/19/2010) and its three implementing Guides:

- DOE Guide 420.1-1, *Nonreactor Nuclear Safety Design Criteria and Explosive Safety Criteria Guide for Use with DOE O 420.1, Facility Safety* (03/28/2000)
- DOE Guide 420.1-2, *Guide for the Mitigation of Natural Phenomena Hazards for DOE Nuclear Facilities and Nonnuclear Facilities* (03/28/2000)
- DOE Guide 420.1-3, *Implementation Guide for DOE Fire Protection and Emergency Services Programs for Use with DOE O 420.1B, Facility Safety* (09/27/2007)

**JUSTIFICATION:** Background: DOE Order 420.1B provides requirements for safety design of DOE facilities to address several significant facility safety hazards that could impact workers or the public, including:

- Nuclear Material and Explosion Hazards
- Natural Phenomena Hazards (earthquakes, tornadoes, etc.)
- Fire Hazards
- Nuclear Criticality Hazards



In addition, DOE Order 420.1B, includes requirements for Fire Protection and System Engineer Programs that extend beyond facility design addressing support or infrastructure needs such as emergency response. DOE Order 420, was first issued in 1995 during a directives reform initiative where four “four digit” Orders were streamlined and consolidated into this one Order. Two significant revisions and several page changes have occurred since 1995 to address specific issues, such as inclusion of Specific Administrative Controls and System Engineer Program requirements; however, the basic format of the Order (broken into several topical areas) and content (requirements) has remained largely unchanged. The latest revision was a page change to reflect changes in DOE organization responsibilities and add a requirement to implement DOE Standard 1189-2008, *Integration of Safety into the Design Process*, issued in March 2008.

The Order, and its three Guides, must be revised as a group to ensure that they remain consistent with the implementation guidance matching the associated requirements. As part of the revisions, development efforts will ensure that the necessary safety design requirements reside only in the Order and not in the Guides.

Summary of Development Process: In accordance with the 2010 reform effort, the Office of Nuclear Safety Policy and Assistance within the Office of Health, Safety and Security, has established a Nuclear Safety Directive Reform Steering Committee to scope out potential changes to the Order and implementing Guides and to identify working group participants in the reform effort. In addition, to identify areas for improvement, the Office of Nuclear Safety and Policy Assistance has reached out to several stakeholder groups, including DOE’s Criticality Safety Support Group, Fire Safety Committee, Safety System Oversight Steering Committee, and the Energy Facility Contractors Working Group. Further coordination with these groups and other stakeholders will continue during the revision development process.

Applicability: The current Order is organized into five Chapters with the following applicability:

- Chapter 1: *Nuclear and Explosives Safety Design Criteria* – Hazard Category 1, 2, and 3 Nuclear Facilities and Explosives Facilities
- Chapter 2: *Fire Protection* – All Facilities
- Chapter 3: *Nuclear Criticality Safety* – Facilities with Fissile Material above specific limits
- Chapter 4: *Natural Phenomena Hazards Mitigation* – All Facilities
- Chapter 5: *System Engineer Program* – Hazard Category 1, 2, and 3 Nuclear Facilities

No changes to the Order’s current applicability are being proposed.

Major Changes: The directives will be reviewed to ensure consistency with DOE Order 251.1C, *Departmental Directives Program* (01/15/2009). The following areas have been identified during the scoping review as potential areas to be clarified, streamlined, or otherwise improved based upon lessons-learned from use and advances made in external consensus standards and industry practices.

### Major Changes to the Main Body of the Order

- Modify the main body of the Order to include only DOE-specific requirements rather than any applicable to contractors and appropriate to the Contractor Requirements Document (CRD).
- Include only high-level roles and responsibilities with detailed requirements (e.g., approval of specific program documents to be included in the *Requirements* section of the Order).
- Include a clear requirement for Safety System Oversight program implementation (DOE companion to the contractor System Engineer Program) to ensure continuity of past direction and current practices.

### Major Changes to the Contractor Requirements Document

- Modify Chapter 1 (Nuclear Safety and Explosive Safety Design Criteria) of the CRD to consider removal of explosive safety requirements and have all requirements in the DOE Manual 440.1-1A, *DOE Explosives Safety Manual*.
- Modify Chapter 2 (Fire Protection) of the CRD to re-organize and clarify requirements to facilitate ease of use and implementation and to better align them with changes being made to DOE Standard 1066-99, *Fire Protection Design Criteria*. The writing group will also address issues related to requirements for building code administration, processing fire protection exceptions, and wild land fire management.
- Modify Chapter 3 (Nuclear Criticality Safety) of the CRD to reflect updates in DOE and national consensus standard as appropriate and lessons learned from implementing the CRD requirements.
- Modify Chapter 4 (Natural Phenomena Hazards Mitigation) of the CRD to reflect updates in national consensus standards as appropriate.
- Modify Chapter 5 (System Engineer Program) to better focus on Configuration Management and lessons-learned from implementation of System Engineer Programs.

### Major Changes to Implementation Guides

- All implementation Guides will be “scrubbed” to remove requirements language (such as “must” statements), consistent with Order 251.1C, which establishes guides as acceptable but not mandatory methods for implementing associated requirements.
- All implementation Guides will be updated to reflect changes made to DOE Order 420.1B as part of this reform effort.
- DOE Guide 420.1-1 was approved for revision by the Directives Review Board in January 2010 to: (1) make it consistent with DOE Standard 1189, (2) provide guidance on

confinement systems, (3) provide guidance on use of industry standards, and (4) update references to industry and DOE standards. These changes, put on hold while details of the Reform Initiative were being finalized, will now move forward.

- DOE Guide 420.1-2 will be revised to address changes in Natural Phenomena Hazards analysis and criteria specified in DOE Standard 1189 as well as updates made in national standards.
- DOE Guide 420.1-3 will be examined to determine whether it is redundant to DOE Standard 1066, *Fire Protection Design Criteria*, and whether it is more logical to include all the associated fire protection guidance and criteria in a single document. Initial reviews have indicated that this consolidation would be appropriate and that the Guide may be cancelled, with any residual relevant material consolidated into the Standard.

**Recommended Development Schedule:** The proposed schedule for directives development is provided below.

**IMPACT:** The revision will update the Order to clarify its requirements and better align it with national standards and DOE directives. The revision will address lessons-learned that should enhance its efficient and effective implementation. Revising the Guides at the same time has the added benefit of reducing impact to the field.

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**DECISION:**

Concur:  Non-concur: \_\_\_\_\_ Date: 9-23-10

<b>Timeline: Schedule for Directives Development</b>	<b><u>Standard</u> (Days)</b>	<b><u>Proposed</u> (Days)</b>
Draft Development (Writer)	60	60
Process/Post (MA-90)	5	5
Review and Comment (Interested Parties)	45	45
Comment Resolution (Writer)	30	45
Process/Post (MA-90)	5	5
Concurrence (Writer)	15	15
Preparation of Final Draft (Writer)	5	15
<b>Total</b>	<b>165</b>	<b>190</b>

*Request additional time for comment resolution and final draft.*