



Proposed Revisions to DOE's Fire Protection Program

A Review of major changes to:
DOE Order 420, *Facility Safety*;
DOE-STD-1066 – *Fire Protection Design Criteria*

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Program's Regulatory Status

- * DOE's Fire Protection program is Regulated by the Department's Facility Safety Order (DOE O 420. B – 12/2005)
- * The Office of Health Safety and Security (HS-32) is the Office of Primary Interest (OPI) for the Order
- * In April, 2011 Order 420.1 C entered the Directives Review Process as a part of a major regulatory review process undertaken by HSS
- * To date the Order revision (O 420.1 C) has received approval from the Directives Review Board contingent on the publication of 2 DOE Technical Standards, DOE-STD-1066, *Fire Protection* and DOE-STD-1020, *Natural Phenomena Hazards*
- * On April 29, 2012 DOE-STD-1066 was approved for publication. DOE-STD-1020 is nearing final concurrence



Facility Safety Order

Order 420.1 was originally developed in October of 1995 to soften the specifics that existed in past regulations such as DOE 6430.1 A, *General Design Criteria* and the 5480 series including Order 5480.7 A, *Fire Protection*.

This Current revision (O 420.1 C) revisits the specify in these past regulations; clarifies; and, in some cases – relieves some of the regulatory burdens that existed at the time - but may no longer be applicable to the Department.



Facility Safety Order Revisions

Front End –

- Removed all requirements that were not specific to DOE - Streamlined and Clarified
- Clarified Authority Having Jurisdiction delegation requirements
- Added Safety System Oversight requirements (was in different DOE Directive)

Contract Requirements Document – Attachment 1

- Clarified requirements for exemptions

Contract Requirements Document – Attachment 2

Chapter 2: Fire Protection

- Reorganized requirements to better reflect topical areas of design, operations, and emergency response
- More specifically invoked Standard 1066 (which was revised to incorporate information from several related standards and guides to provide a single source, and was further revised to address DNFSB Recommendation 2008-1 on safety class/significant FP systems)



Order 420.1 C Specifics

Order 420.1 B

Applicability: " ... this Order applies to all DOE elements with responsibility for DOE-owned or - leased facilities... "

Order 420.1 C

Applicability: "This Order applies to all DOE elements with responsibility for design, construction, management, operation, decontamination, decommissioning, or demolition of government-owned or government-leased facilities and onsite contractor-leased facilities used for DOE mission purposes. ... "

Order 420.1 C continues to exclude nearly all of the types of facilities or programs that were excluded in Order 420.1 B and added two more:

- Existing design projects (high level of maturity) at the time the Order gets issued; and,
- Offsite Office facilities that are owned or leased by the GSA



Order 420.1 C Specifics

Field Element Responsibilities have been expanded and specified to include:

- Approval of the contractors fire protection program
- Fulfill the roles and responsibilities as the Building Code Official
- Perform responsibilities as the “owner” or other equivalent term in the application of DOE technical standards or industry codes and standards unless delegated.



Order 420.1 C Specifics

Facility Construction

All design and construction, at a minimum, must comply with applicable national consensus industry codes and standards, the International Building Code (IBC) and other requirements as documented in this Order. If approved by the responsible Field Element Manager, state, regional, and local building codes may be used in lieu of the IBC upon contractor submission of a report that demonstrates that implementation of the substituted code for the specific application will meet or exceed the level of protection that would have been provided by the IBC.



Order 420.1 C Specifics

Chapter II of Attachment 2 includes the Department's top tier fire protection program requirements. These were initially written by a task group of the DOE Fire Safety Committee - the intent to structure existing requirements in a certain order; and, clarify some of the ambiguity that existed in certain sections.

What we got from the field when we did this amounted to a majority of the total comments that were received during the Directives RevCom review phase. Through post comment negotiations we now have an adequate set of criteria that we can move forward with.



Order 420.1 C Specifics

Chapter II

DOE O 420.1 B APPLICABILITY.

This chapter applies to both fire protection programs and facility safety design for all DOE elements that have responsibility for DOE nuclear, non-nuclear, and weapons facilities.

DOE O 420.1 C APPLICABILITY.

This chapter applies to organizations that have responsibility for the design, construction, maintenance, or operation of government-owned or government-leased facilities and onsite contractor-leased facilities used for DOE mission purposes. **For leased facilities that are not nuclear hazard category 1, 2, or 3 facilities, the design requirements of this chapter (Section 3.c) apply to the extent determined by the Field Element.**



Order 420.1 C Specifics

Chapter II

Chapter II structure:

1. Objectives
2. Applicability
3. Requirements
 - a. General
 - b. Program Administration
 - c. Design
 - d. Operations
 - e. Emergency Response
 - f. Fire Hazard Analysis and building assessments
 - g. Wildland Fire
 - h. Specific Fire Protection Program Criteria



Order 420.1 C Specifics

Chapter II

Some of the more notable actions of this Order revision include the following:

- Transferred the “Highly Protected Risk” language from the Order to DOE-STD-1066
- Refined and specified protection thresholds:
 - Type I or Type II construction for all **new** facilities over 5,000 s.f.
 - Sprinklers for all **new** facilities over 5,000 s.f. or with an \$5 million dollar MPFL
 - Sprinklers for any facility that:
 - Is required via the Safety Basis Documentation
 - Significant life safety hazard
 - The potential for significant mission interruption
 - Modifications exceed the dollar or area thresholds described above.
 - Property Protection – multiple approaches must be provided if the MPFL exceeds \$150 million. Fire areas must be established if the MPFL exceeds \$350 million.



Order 420.1 C Specifics

Chapter II

Some of the more notable actions (continued):

- The incorporation of wildland fire protection activities into Order 420.1C from Order 450.1, *Environmental Protection Program*.
- Reliance on more specific fire protection program criteria that is contained within DOE-STD-1066 as an acceptable method for implementing the requirements in Order 420.1 C. **Other methods may also be acceptable provided that any alternate approach must provide an equivalent level of safety.**



Order 420.1 C Specifics Chapter II

Chapter II of the Order relies on DOE-STD-1066, *Fire Protection* for a significant amount of technical detail that sites need to consider within its fire protection program



DOE-STD-1066



Fire Protection Program Specifics

DOE-STD-1066-99, *Fire Protection Design Criteria*

- * Intent of the Standard was to capture all the specifics from 6430.1A and 5480.7a that was not included in the Order 420 and its implementation guidance
- * It also supplemented other program guidance such as DOE-STD-1088, *Relocatable Structures*.

DOE-STD-1066-2012, *Fire Protection* is intended to capture all fire protection program guidance that is not addressed by DOE Order 420.1C



DOE-STD-1066

Fire Protection Program Specifics

DOE-STD-1066 replaces the following DOE regulations

- DOE-STD-1088-95, *Fire Protection for Relocatable Structures*
- DOE Guide (G) 420.1-3, *Implementation Guide for DOE Fire Protection and Emergency Services Programs for Use with DOE O 420.1B, Facility Safety*; and,
- DOE G 450-1.4 *Implementation Guide: Wildland Fire Management Program for Use with DOE 450.1, Environmental Protection Program.*
- DOE-STD-1066-99, *Fire Protection Design Criteria*

Additionally, Safety Significant and Safety Class fire protection design specifications were included in response to DNFSB Recommendation 2008-1.

PLUS

The entire standard was updated and reformatted to align with standard engineering requirements similar to that of other Federal agencies and consensus standards organizations



DOE-STD-1066

Fire Protection Program Specifics

Throughout this Standard, the word “shall” is used to denote a requirement; the word “should” is used to denote a recommendation; and, the word “may” is used to denote permission, but not a requirement or a recommendation. To satisfy this Standard, all applicable “shall” statements need to be met. Alternate approaches that demonstrate an equivalent level of safety are also acceptable, if approved by the DOE field element.

Additionally

Nothing in this Standard is intended to limit the application of other fire protection methods when unique situations or hazards warrant an alternate approach. Any alternate approach should provide a level of safety equal to or greater than that achieved by conformance with this Standard. Such alternate approaches should be documented as required by the authority having jurisdiction (AHJ).



DOE-STD-1066

Fire Protection Program Specifics

The Standard is structured to be consistent with the organization of DOE O 420.1C

Section 2, General Fire Protection Requirements

Section 3, Fire Protection Program Administration

Section 4, Fire Protection Design

Section 5, Operations

Section 6, Emergency Response

Section 7, Facility Fire Protection Evaluations

Section 8, Wildland Fire Management



DOE-STD-1066

Fire Protection Program Specifics

There are also a number of appendices that address the following topics:

Appendix A, Safety Significant and Safety Class Fire Protection System Specifications

Appendix B, Fire Hazard Analysis

Appendix C, Relocatable Structures

Appendix D, Transitional Facilities

Appendix E, Sample Qualification Template for Lead Fire Protection Engineers

Appendix F is an endnote summary for explanatory materials that are numbered and located throughout the document. Included with this Appendix is an MS word automation feature such that the endnote text is made visible when the reader positions the mouse cursor over the endnote number.



DOE-STD-1066

Fire Protection Program Specifics

Facts and Opinions about DOE-STD-1066 (2012)

Fact – The update contains direction that may exceed or overlap or conflict or augment those of the Building code. This direction is based mainly on the guidance from past regulations that were developed to address the unique hazards that exist within the Department. These unique hazards are both nuclear and non-nuclear based

Opinion - This Standard will cost bags of dollars more to implement.

Fact – The update it took a long time to develop (upwards of 5 years)

Opinion - The OPI resists regulatory reform



DOE-STD-1066

Fire Protection Program Specifics

Conclusions

- The Order and the Standard are ready for publication
- They may not be perfect, but they do provide clearer direction to SME's on what the Department's expectations are regarding our unique mission
- They also contain clauses to address situations where the Department's direction may not fit with the realities of these unique structures.
- Future guidance needs to both refine and augment this direction by dedicated engineers who have experience with these unique hazards and structures.
- The Fire Safety Committee is the first step to achieving this goal.