

# Frequently Asked Questions (FAQ) from DOE Standard (STD) 1066-2016, *Fire Protection*, and DOE Order (O) 420.1C, *Facility Safety*

**FAQ #1:** DOE O 420.1C, Chg. 1, Attachment 2, Chapter II, Sec 2, *Applicability*, states that the DOE-STD-1066-2016 applies to “*government-owned or government-leased facilities and on-site contractor-leased facilities used for DOE mission purposes.*” Hence it does not apply to off-site contractor-leased facilities used for DOE mission purposes. However, Section 5.3 of DOE-STD-1066-2016 refers only to “leased facilities” without this limitation.

Will revised DOE O 420.1C make clear the requirements applied to offsite, contractor-leased facilities?

Response: Yes, proposed revisions for DOE O 420.1C, i.e., Chg. 2 version, will delete the word “onsite” from Attachment 2, Chapter II, Section 2, *Applicability*:

- 2. APPLICABILITY. This chapter applies to organizations that have responsibility for the design, construction, maintenance, or operation of government-owned or government-leased facilities and ~~on-site~~ contractor-leased facilities used for DOE mission purposes.

**FAQ #2:** Section 2.2.9 of DOE-STD-1066-2016 states: “*Operational provisions of the most recent codes and standards (promulgated after the original design COR) should be evaluated and implemented to the extent practicable. Such operational provisions include inspection, testing, and maintenance necessary to ensure that design functions are preserved during the operational lifetime.*”

To what extent does this provision apply to facilities having only laboratory-scale quantities of radioactive or toxic substances? Could a “generic equivalency” or interpretation be issued indicating what operational provisions laboratories need to meet?

Response: Section 2.2.9 does not state a requirement, only a suggested good practice which is conditioned by “to the extent practicable.” Accordingly, an equivalency is not needed with respect to this section.

DOE expects, however, that sound engineering judgement be applied when evaluating operational provisions of the most recent codes and standards for application to existing facilities. Operational requirements are promulgated by code bodies such as NFPA to ensure that existing equipment and systems remain operable and effective in preventing or mitigating fires.

Decisions not to adopt changes in operational code requirements and recommendations do not require an equivalency or exemption, but the basis for these decisions should be documented in the FHA or Code of Record (COR) document.

**FAQ #3:** Section B.2.6 of DOE-STD-1066-2016 states the following on Fire Hazard Analysis (FHA) development: *“The FHA should evaluate the consequences of a single, worst-case automatic fire protection system malfunction. Examples of such malfunction include failure of a detection system used to activate a pre-action type sprinkler system and the failure of a valve in the underground main resulting in loss of water supply.”*

How does this example relate to the Maximum Possible Fire Loss (MPFL) determination? It seems more closely-related to the Maximum Credible Fire Loss which was deleted from the standard in 2012.

Response: STD-1066-2016 defines MPFL as follows: *“The dollar cost of restoring damaged property in a single, well-defined fire area, from a hypothetical fire event, assuming the failure of both automatic fire suppression systems and manual fire-fighting efforts.”* (Emphasis added)

Note that while the failure assumption of Section B.2.6 is a “single, worst-case automatic fire protection system malfunction,” the MPFL is defined by failure of all automatic fire suppression systems together with failure of manual firefighting capabilities. Hence, The MPFL is postulating a fire without any active mitigation, whereas the requirement in Appendix B.2.6 is postulating the failure of just the installed automatic suppression system and not manual firefighting capabilities.

The purpose of the two provisions is also different. MPFL is used to decide the level of fire protection required in a fire area, whereas the Appendix B provision is aimed at supporting accident analyses such as a nuclear facility Preliminary Design Safety Analysis (PDSA) in a design project.

**FAQ #4:** Section 4.2.4.3.4 states: *“Fire Barrier Identification and Inspection. Fire barriers necessary for life safety, nuclear safety, hazard protection, or property protection should be (1) identified with appropriate signs or facility maps to help prevent improper breaches, and (2) periodically inspected to detect deterioration of the barrier, firestop/joint systems, and opening protective systems.”* (Emphasis added)

What criteria should be applied for these periodic inspections? And what is the meaning of “periodically”?

Response: The standard allows for flexibility in this area. Criteria specified in the barrier inspection program would normally include visual inspection for structural integrity and continuity, evidence of additional, unauthorized penetrations, integrity of penetration seals or dampers, and any obvious changes in combustible loading for which the barrier was designed. “Periodically” may in some cases be determined by nuclear technical safety requirements (TSRs). In the more general case, yearly inspection would normally be considered adequate.

Additionally, it is recognized that section 5.1.3.2 of the standard provides inspection requirements for NEW fire barrier fire stop systems and is inappropriate for operational, inspection, testing and maintenance activities.

**FAQ #5:** Section 4.4.5 states: *“Protection of Essential Electronic/Information Technology Equipment. Unless otherwise directed by the DOE Field Element Manager, high monetary value (over 10 million dollars) and mission essential electronic/information technology equipment shall be designed and installed according to NFPA 75, Standard for the Fire Protection of Information Technology Equipment. The need for supplemental fire protection (such as clean agent systems) shall be determined based on an analysis by, or under the direction of, an FPE with input and concurrence by major stakeholders. Examples of systems that should be considered for supplemental protection include advanced computing systems, mission-critical computing systems, control room computer systems, data storage libraries, and automatic information storage systems.”* (Emphasis added)

Should this \$10 million figure be used to define “high monetary value equipment” generally?

Response: The term “high monetary value equipment” in Section 4.4.5 applies only to “essential electronic/information technology equipment.” However, DOE-STD-1066-2016 does use the term “high-value property” in three places (Sections 4.2.5.4, 7.2.3, and B.2.4) and has no definition provided. The following definition appearing in the 2012 version of DOE-STD-1066 may be used when implementing Sections 4.2.5.4, 7.2.3, and B.2.4.:

High Value Equipment – Equipment (such as cranes, pumps, valves, control panels, etc.) that has a value exceeding the level of loss established by the authority having jurisdiction, or a one-of-a-kind piece of equipment that cannot readily be replaced.

**FAQ #6:** Section 4.2.5.3, “Lightning Protection,” cites National Fire Protection Association (NFPA) 780 as the applicable NFPA standard for lightning protection. This section also states: *“NFPA 780 describes how to determine the need for lightning protection and how to install and maintain lightning protection systems when required. (See also DOE-STD-1020-2016, Natural Phenomena Hazards Design and Evaluation Criteria, for DOE Facilities, for additional information on lightning protection).”*

Determining the need for lightning protection is addressed only in the annexes of NFPA 780, which are not part of the code and hence not mandatory. Yet sites are being pushed to retrofit lightning protection systems on existing buildings based on this guidance. What is DOE’s expectation in this regard?

Response: DOE is responsible for the safety of its employees and the protection of its property from lightning hazards, regardless of the age of a facility. Lightning protection is also required by DOE-STD-1020-2016 for both nuclear and nonnuclear facilities. Retrofitting and upgrading of lightning protection features on existing structures is within the discretion of the relevant DOE program office and field element manager.

**FAQ #7:** Section A.2.3 states: *“Support Systems for the Wet Pipe Sprinkler System. Examples of support systems (beyond the water supply system) may include the freeze protection system, alarm devices and associated trim, and pressure monitoring systems. The general criteria in DOE G 420.1-1A specify that support systems are to be designed, fabricated, erected, and tested to standards and quality requirements commensurate with their importance to safety. The support systems shall be classified as equal or superior to the classified wet pipe sprinkler system, if they are essential to the sprinkler system performing its safety function.”* (Emphasis added)

Assume that a sprinkler system was classified as safety-significant prior to issuance of DOE-STD-1066-2012. Also assume that this system is protected by a freeze protection system that has not been classified as safety-significant. Does DOE interpret Section A.2.3 to require that supporting systems be upgraded in this situation?

Response: The introduction to Appendix A states: *“This appendix does not apply to existing fire protection systems that have already been classified as SS or SC in Hazard Category 1, 2, and 3 nuclear facilities.”* If a fire protection system was classified as SC or SS prior to the issuance of DOE-STD-1066-2012, it does not have to meet the applicable criteria of Appendix A, including criteria for support systems. Hence, upgrading would not be required in this situation. Note that this also applies to appendix A, section A.3.1.1.2 which addresses an assessment of the long term availability and reliability of water supply systems required to support a safety-related suppression system for an enduring missions and erroneously states: *“For enduring missions, a new, appropriately-designed, safety-related water supply system shall be provided.”* The intent of this statement is to provide a new upgrade only if the assessment recommends such an upgrade.

**FAQ #8:** Section 1.5 defines “Limited Supply Suppression System” and offers a parenthetical example of the proprietary Vortex system. Section 4.4.2.6 indicates that where no code is available that addresses a particular system, it must be approved by the Authority Having Jurisdiction (AHJ). Since the Vortex is one such system, is it considered approved already or does it need to go through a specific approval process?

Response: The Section 1.5 parenthetical statement should not be taken as a DOE approval. AHJ approval would be needed for use of a Vortex system.

**FAQ #9:** DOE O 420.1C, Chg. 1, Attachment 2, Chapter II, Sec 3.c.(2) *Protection Thresholds*, includes requirements for complete automatic fire protection throughout a facility under certain conditions. DOE-STD-1066-2016 includes a new Appendix that addresses supplemental fire protection requirements for DOE subterranean facilities (Appendix D). In section D.2.1 an exception to the order requirement for complete automatic fire protection throughout a facility is provided with conditions. Is section D.2.1 in conflict with DOE O 420.1C, Chg. 1, Attachment 2, Chapter II, Sec 3.c. (2)?

Response: Yes, proposed revisions for DOE O 420.1C, i.e., Chg. 2 version, will address protection thresholds with the following footnote: *“Some of the requirements in this section on*

*Protection Thresholds may not apply to portions of subterranean facilities that otherwise meet the requirements in Appendix D of DOE-STD-1066-2016.”*

**FAQ #10:** The last sentence of Section 4.2.8.1.1 states: *“When required, a fire alarm system shall be provided for DOE facilities to monitor fire suppression and detection systems, to notify occupants, to perform safety functions, and to notify emergency responders.”* Section 4.2.8.1.2 has nearly the exact statement except that the “When required” was removed, therefore adding a conflict with the previous section. Which statement is the more correct statement?

Response: The intent of revising DOE-STD-1066 was to separate section 4.2.8.1.1 into two parts with the last sentence of 4.2.8.1.1 included as the new section 4.2.8.1.2. Therefore, section 4.2.8.1.2. should read: *“When required...”*.

**FAQ #11:** The endnote provided in section 4.2.1 (endnote 21) references the use of Chapter 43 of the Life Safety Code (NFPA 101) and Chapter 34 of the International Building Code (IBC) as resources for criteria that are relevant for defining significant modifications from a building code perspective. In the 2012 version of DOE-STD-1066 this language was included as endnote 14 that also included NFPA and IBC references stated above as well as including the International Existing Building Code (IEBC). Chapter 34 of the 2012 version of the IBC was called Existing Building Allowances which was incorporated sometime later into the IEBC. Should we therefore be looking to NFPA 101 and the IEBC and not the IBC for these significant building modification criteria?

Response: Yes, NFPA 101 and the IEBC are the appropriate references.

**FAQ #12:** References are provided throughout the standard for *“Program Secretarial Officer”*, but DOE O 251.1D, *Departmental Directives Program* makes no reference to this individual or office and instead references a similar authority which is called *“Head of the Departmental Element”*. Are these individuals or offices the same?

Response: Yes, *“Program Secretarial Officer”* is the same as *“Head of the Departmental Element”*. Proposed revisions for DOE 420.1C, i.e., Chg. 2 version, will address this new term.