

NFPA 400-2019 Edition
Hazardous Materials Code
TIA Log No.: 1443

Reference: Table 5.3.7

Comment Closing Date: May 30, 2019

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www.nfpa.org/400

1. Revise Table 5.3.7 to read as follows:

Table 5.3.7 Detached Buildings Required Where Quantity of Material Exceeds Amount Shown

Material	Class	Quantity of Material	
		Solids and Liquids (tons)	Gases ft ³ (m ³) ^{*a}
Individual bulk hydrogen compressed gas systems	N/A	N/A	15,000 (425)
Oxidizers	3	1,200	N/A
	2	2,000	N/A
Organic peroxides	I, IIA, IIB, III, and IV	See Note	N/A
		I ^b	
		IIA ^b	
		IIB ^b	
Unstable (reactive) materials	3, nondetonable	1	2,000 (57) ^{‡c}
	2	25	10,000 (283) ^{‡c}
Water-reactive materials	3	1	N/A
	2, deflagrating	25	N/A
Pyrophoric gases		N/A	2,000 (57)

For SI units, 1 ton = 0.9 met ton.

N/A: Not applicable.

Note: See MAQs of organic peroxide formulations in nonsprinklered and sprinklered buildings in Table 14.3.2.1(a) and Table 14.3.2.1(b), respectively.

*^a See Table 21.2.5.

^bWhen two or more different classes of organic peroxide formulations are stored, see 14.3.2.5.

^{‡c}Nondetonable.

Substantiation: The purpose of this request is to reinsert critical language from the 2016 Edition that was inadvertently left out of the 2019 Edition. As explained below, without this language the code does not allow non-detached storage of organic peroxides when quantities exceed MAQs.

The issue addressed by this TIA is the absence of non-detached Protection Level storage quantity limits for organic peroxide formulations of Class I, IIA, IIB and III in the 2019 edition of NFPA 400. The issue was discussed at length and it was agreed by the NFPA 400 Organic Peroxides Task Group comprised of the following members that a TIA as proposed is necessary to address the issue.

- Alwin Kelly, Jensen Hughes & NFPA 400 Technical Committee member
- Bob James, UL & NFPA 400 Technical Committee Chair
- Irene Uriate Villanueva, FM Global & NFPA 400 Technical Committee member
- John Schweitzer, ACMA Representative
- Kris Jaggari, OPPSD Storage Committee Chair, Nouryon
- Mark King, OPPSD Storage Committee Member, representing United Initiators
- Patrick Krieger, PLASTICS Representative
- Paul Iacobucci, OPPSD Storage Committee Member, Nouryon & NFPA 400 Technical Committee member
- Peter Dluzneski, OPPSD Storage Committee Member, Arkema & NFPA 400 Technical Committee alternate member
- Tony Ordile, Haines Fire & Risk Consulting Corporation & NFPA 400 Technical Committee member

The 2019 edition of NFPA 400 included a change to Table 5.3.7 regarding organic peroxide formulations. Quantity limits for Protection Level storage of organic peroxide formulations of Classes II and III were removed. Instead a new note was included in Table 5.3.7 for Classes I, IIA, IIB, III, and IV referring to Tables 14.3.2.1(a) and 14.3.2.1(b).

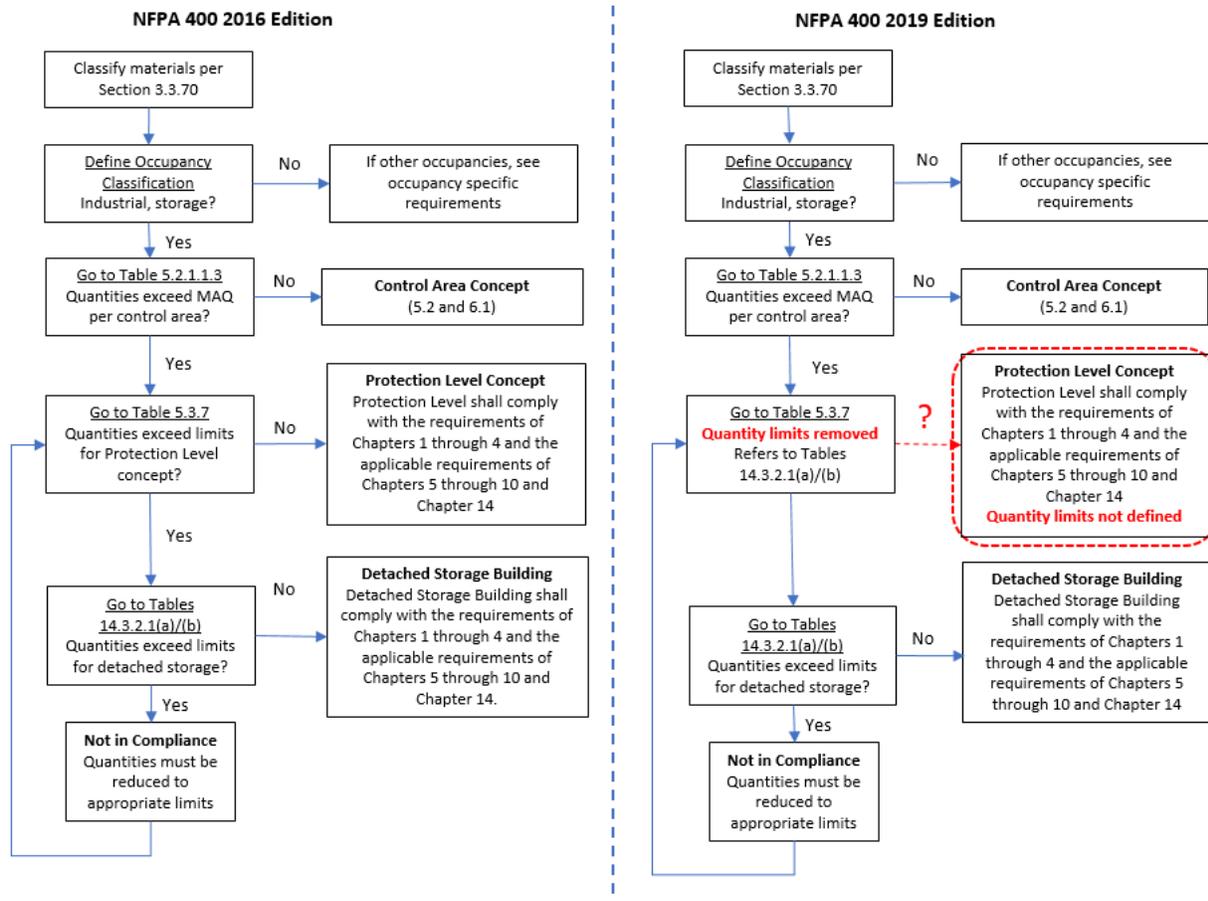
It is understood that this change to Table 5.3.7 was intended to occur with simultaneous updates to Tables 14.3.2.1(a) and 14.3.2.1(b) to better reveal the storage arrangements for organic peroxides using approaches other than detached storage. However, an inadvertent deficiency was created in the quantities management framework when Tables 14.3.2.1(a) and 14.3.2.1(b) only included detached storage arrangement limits in the 2019 edition.

In the 2016 edition of NFPA 400 Tables 14.3.2.1(a) and 14.3.2.1(b) included quantity limits for “Cutoff” and “Segregated” non-detached storage arrangements. These categories of storage were included in the predecessor codes to the first edition of NFPA 400, e.g. NFPA 432 for Organic Peroxide Storage. Cutoff and segregated approaches are outdated concepts in the new code, NFPA 400. Therefore Tables 14.3.2.1(a) and 14.3.2.1(b) were modified in the 2019 edition to remove quantity limits for “Cutoff” and “Segregated” storage arrangements thus aligning the tables with the new paradigm; Tables 14.3.2.1(a) and 14.3.2.1(b), however, were not modified to include the non-detached Protection Level option.

As a result, no quantity limits for the non-detached Protection Level concept were left in either Table 5.3.7 or Tables 14.3.2.1(a) and 14.3.2.1(b). This leaves a conundrum for users and enforcement personnel. There are no quantity limits for storage of organic peroxides when quantities exceed MAQs per control area other than the limits for detached storage. This implies that a detached building would be required for storage when quantities exceed MAQs.

The revision requested by this TIA would provide the clarity of non-detached sprinklered Protection Level storage limits by way of an update to Table 5.3.7. The limits would remain the same as in the 2016 edition, as would the Protection Level requirements.

This gap can be seen below using a side-by-side view of flowcharts illustrating the code framework for storage of organic peroxides in the 2016 and 2019 editions:



As shown above, there is a missing link in the 2019 edition as quantity limits for the non-detached Protection Level concept are not defined. The proposed changes to Table 5.3.7 are intended to reinstate the quantity limits provided in the 2016 edition for sprinklered Protection Level storage and close this gap. Where two or more different classes of organic peroxide formulations are stored, Chapter 14 provides a clear directive by 14.3.2.5. It was agreed by the Task Group that this should also be referenced in Table 5.3.7 to provide clarity to the users of the Protection Level concept should they require to store together two or more different classes of organic peroxide formulations.

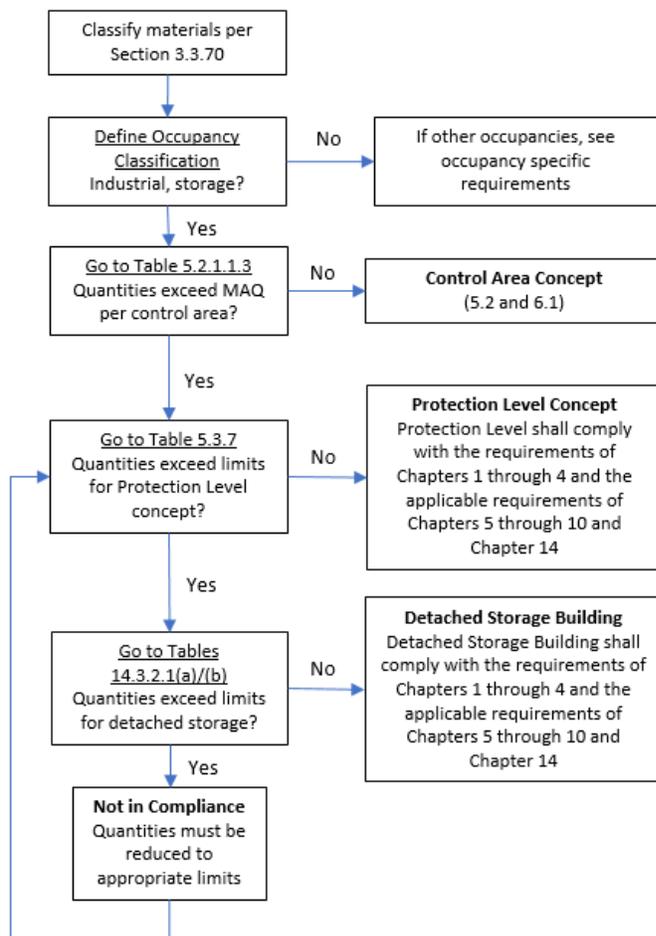
14.3.2.5* Where two or more different classes of organic peroxide formulations are stored in the same area, the following shall apply:

- (1) The maximum quantity permitted shall be limited to the sum of the proportional amounts that each class bears to the maximum permitted for that class.
- (2) The total of the proportional amounts shall not exceed 100 percent.

For Class I, 1 ton (907 kg) was allowed in the 2016 Chapter 14 Table 14.3.2.1(b) under the old Cutoff storage concept and is now proposed to be included in Table 5.3.7 for sprinklered non-detached Protection Level storage. Given the lower burn rates of organic peroxide formulations of Class IIB when compared to those of Class IIA, a larger quantity limit of 35 tons for Class IIB should be allowed in a sprinklered non-detached Protection Level storage. This would be in line with the revisions made in 2019 edition when Class II was split to Class IIA and Class IIB, and

the corresponding quantities assigned to Class IIB in Chapter 14. A proposal to this extent shall be made during the public input period of the revision cycle of 2022 edition, along with other comprehensive changes to the code that this Task Group is working on. These comprehensive changes would include reinstating the non-sprinklered and sprinklered non-detached Protection Level storage quantity limits in Tables 14.3.2.1(a) and 14.3.2.1(b) respectively in Chapter 14 along removing the remaining references to the Cutoff storage and adding Protection Level references in the Chapter 14. The comprehensive changes will also include many additional preventive and protective measures for the safe storage, handling and use of the organic peroxides. The Task Group discussed and agreed that the proposed change in Table 5.3.7 by the TIA process is the simpler option as against making many changes in Chapter 14 by this process now. The Task Group also agreed that any language or quantity limits that were not in 2016 or prior editions should go through the regular revision cycle approval process of the 2022 edition. Hence, the TIA with the proposed changes to reinstate quantity limits in Table 5.3.7.

The flowchart below presents a logic flow for the storage conditions/arrangements of organic peroxides with implementation of the proposed modification to Table 5.3.7. The three storage arrangements (Control Area, Protection Level, and Detached Storage) are clearly provided with corresponding quantity limits based on material classification, occupancy classification, and general building characteristics and protection.



Emergency Nature: The standard contains an error or an omission that was overlooked during the regular revision process. The proposed TIA intends to correct a circumstance in which the revised NFPA Standard has resulted in an adverse impact on a product or method that was inadvertently overlooked in the total revision process or was without adequate technical (safety) justification of the action.

The recent change to Table 5.3.7 in the 2019 edition of NFPA 400 results in omission of quantity limits for Protection Level storage arrangements of organic peroxides and ultimately an incomplete code pathway. Strict enforcement of the 2019 edition of NFPA 400 would force users and all storers of organic peroxides in quantities exceeding maximum allowable quantities per control area to store only in detached buildings. This does not coincide with the approach of the intended code framework and would require users and all storers of organic peroxides to implement unnecessary capital investments or facility modifications. The proposed changes alleviate this incomplete code pathway and reinstate quantity limits for Protection Level storage of organic peroxides.

Anyone may submit a comment by the closing date indicated above. Please identify the TIA number and forward to the Secretary, Standards Council. [SUBMIT A COMMENT](#)