Public Comment No. 16-NFPA 780-2015 [Global Input]

Type your content here ...I was unable to make comments to individual sections of NFPA 780. I could search for submitted or unsubmitted comments but no where did I see a comment box like this to actually type in the comments.

1. Section 8.4.1 requires explosives facilities to have a "ground ring conductor." Is a "ground ring conductor" the same as a "ground ring electrode?" Or are they different? Could an explosives facility have a ground ring conductor connected to a ground ring electrode, or would that be reduntant? There is no defination of a ground conductor or ground ring conductor in chapter 3. If a ground ring conductor is the ground ring electrode why have other grounding methods listed (concrete-encased electrodes (8.4.2), Radials (8.4.4), Plates (8.4.5)?

2. Section 8.7.2 Piers and Wharfs - This seems to require 3 ground loop conductors. One for the LP, one for connecting metal objects on the pier (bollards, safety rails, RR tracks) and if we chose to connect to a water ground (salt or fresh water) then it requires its own ground loop conductor. All of these ground loop conductors must be interconnected. A water ground, although very effective, is not listed as one the allowable grounding mediums (hint - include water grounds as authorized grounding types). I suggest that we allow piers and wharfs to have one "ground loop electrode" and connect the LP, the RR track and the salt water ground to the same "ground loop electrode."

3. Chapter 4, tables 4.1.1.1.1 and 4.1.1.1.2 - Consider allowing the use of steel (or at least galvinized steel) in LP applications. To do so you'd need to make changes to the two referenced tables as there is no entry for steel or galvinized steel. Steel is authorized for catenary LP systems but what sizes? What weights per 1000 ft? Do we use the copper columns or the aluminum columns? From some internet research I've done steel is close to the conductivity of aluminum. So, I recommend we use the aluminum column for steel application.

4. Section 8.7.3 - I find this section flawed for two reasons, one it addresses all cranes regardless of size or use, secondly the criteria seems to address static dissipation not lightning protection. If I were to fix this I'd recommend wording that would require application when explosives not in DOT packaging are being lifted by the crane. What risk is there when a bridge crane lifts an ISO container of munitions packaged to DOT standards on an ammo pier? Chances are we are not loading ammo on a ship during a thunderstorm, but even if we did the ISO container is a "poor man's faraday cage." Secondly, it would be extremely difficult to electrically isolate the cable and hook of a crane from the crane frame (as seems to be required in sections 8.7.3.1 and 8.7.3.3) and once again I need two separate (but connected) "ground loop conductors." So, if I had a bridge crane on an ammo pier would it require 5 separate "ground loop conductors" (3 for the peir and 2 for the bridge crane)? From my perspective the only time I'd want to electrically isolate the cable/hook assembly from the boom is if I was concerned about static spark generation....which is not an LP concern.

5. Section 8.10.7.6 Requires the three-point-fall-of-potential test (3pt-T) for grounding systems of explosives facilities. I believe that 3 pt-T is not a viable test when you have a ground loop electrode. The 3pt-T seems to be more designed for a ground rod system. A ground loop electrode system is a giant ground rod lying on its side. It likely measures to the nearest point on the ground loop electrode and not the loop "as a whole." As far as grounding systems go, a ground ring electrode is considered the best grounding system. If a ground ring electrode fails a 3pt-T how would you fix it, you already have the best possible system? Within the Army explosives community if a ground loop electrode system fails 3pt-T then we then annotate that last test value as the new base line and look for further deterioration. Given the fact that the 3pt-T is not a viable test of the ground loop electrode and the fact that it is considered to be the ultimate grounding system I see no reason to conduct a 3pt-T on a ground loop electrode system. I ask that the NFPA 780 committee to consider exempting ground loop electrode grounding systems from 3pt-T.

Submitted by Greg Heles, US Army Technical Center for Explosives Safety, 918 420-8877.

Additional Proposed Changes

File Name	Description	Approved
Conductivity_comparisons_of_common_metals.docx		

LP_Issues_submitted_to_DOD_LP_Meeting_March_2015.docx

Statement of Problem and Substantiation for Public Comment

1) Term grounding conductor is used but not defined. Is the same as ground loop electrode?
2) Chapter 8 sections on piers and cranes are vague and seem to require excessive grounding/bonding
3) NFPA 780 should allow the use of steel in LP applications
4) NFPA should rescind the requirement for doing 3-pt test on structures/locations having ground loop electrode systems

Also, see attached documents to this public comment.

Related Item

First Revision No. 30-NFPA 780-2014 [Section No. 8.4.1]

Submitter Information Verification

Submitter Full Name: Greg Heles
Organization: US Army
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 25 14:18:12 EDT 2015

Committee Statement

Committee Action: Unknown Reason

Resolution: The submitter has not provided text for consideration as required by the Regulations Governing The Development of NFPA Standards, 4.4.4.3(c). The Global comment does not provide specific recommendations for changes to the document. Some of the items identified in the comment have been resolved in a manner that the TC considers to resolve those items. Specifically: 1. This was corrected by FR-30 in the First Revision. The term "ground ring conductor" was replaced by the term “ground ring electrode” in 8.4.1 of the First Revision. 2. This is covered by PC-74 (See SR-21; 8.7.2) 3. This was addressed in the First Revision and the committee determined that Table 4.1.1.1.1 and Tables 4.1.1.1.2 should not be modified because steel conductors are allowed only for overhead ground wires. First Draft 4.6.4.4 requires that the diameter of overhead wires shall be a minimum of 13 mm. 4. This is addressed in PC-74 (See SR-21; 8.7.2) 5 Reject. There were no Public Inputs received on this clause and therefore no new changes are allowed during the Comment period. The Committee does not agree that the three-point-fall-of-potential test is not viable for ground ring electrodes. If the size of the grounding system is too large or area available for the reference electrodes is insufficient, the test engineer is allowed to isolate specific electrodes and estimate the grounding resistance based on formulas available for such calculations. It is also permissible to conduct three-point-fall-of-potential impedance tests which require less real estate than low frequency resistance tests. If a ground ring electrode fails to meet a maximum resistance criteria there are ways to improve the resistance to earth of the system. The most common technique would be to supplement the ground ring electrode with supplemental electrodes such as driven rods, plates, or radials. While NFPA 780 does not specify a maximum grounding system resistance or impedance value, the technique identified where any value exceeding a specified level will become the new maximum is not recommended because there is no trigger that suggests the grounding system be investigated for damage or corrosion. A resistance measurement value greater than an established baseline value should be investigated for cause; which is why the Committee does not agree with the recommendation to exempt any type of grounding system for explosives facilities from periodic electrical testing.

Public Comment No. 56-NFPA 780-2015 [New Section after 1.6]

1.6.1

Periodic inspections or testing **of the completed installation** for compliance to **the current** standard shall be done at **intervals** determined by the authority having jurisdiction.

Statement of Problem and Substantiation for Public Comment

CI # 123 - adds section for industry comments
Additional wording added for clarification and discussion.

Related Item

Committee Input No. 123-NFPA 780-2014 [New Section after 1.6]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 07 10:27:18 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-1-NFPA 780-2015

Statement: The Technical Committee makes the change to assist the Authority Having Jurisdiction (AHJ) to maintain sound lightning protection systems.

The Technical Committee does not retain “to the current standard” to enable the AHJ to determine what document edition is to be used for compliance.

The Technical Committee adds “for compliance to this standard” for clarity.

Public Comment No. 66-NFPA 780-2015 [New Section after 1.6]

1.6.1 Periodic inspections or testing for compliance to this standard shall be done at an interval as determined by the authority having jurisdiction.

Statement of Problem and Substantiation for Public Comment

I support Public Comment 66. Just like your automobile a LPS requires periodic maintenance. To determine what maintenance needs to be performed an inspection is necessary. Periodic inspections should be performed to determine that the LPS complies with this Standard.

Related Item

Committee Input No. 123-NFPA 780-2014 [New Section after 1.6]

Submitter Information Verification

Submitter Full Name: CARL JOHNSON II
Organization: AVCON INC
Affilliation: none
Street Address:
City:
State:
Zip:
Submittal Date: Sat May 09 12:32:08 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-1-NFPA 780-2015

Statement: The Technical Committee makes the change to assist the Authority Having Jurisdiction (AHJ) to maintain sound lightning protection systems.

The Technical Committee does not retain “to the current standard” to enable the AHJ to determine what document edition is to be used for compliance.

The Technical Committee adds “for compliance to this standard” for clarity.

Public Comment No. 99-NFPA 780-2015 [New Section after 1.6]

1.6.1 Periodic Inspection

Periodic inspections or testing for compliance to this standard shall be done at an interval as determined by the authority having jurisdiction.

Type your content here ...

Statement of Problem and Substantiation for Public Comment

Mandates that the lightning protection system be inspected or test after the original installation , while providing latitude for the interval at which it will be done.

This is very important. Lightning protection system exists on structures that are over one hundred years old. The owners of those facilities think they have effective lightning Protection.

Related Item

Committee Input No. 123-NFPA 780-2014 [New Section after 1.6]

Submitter Information Verification

Submitter Full Name: STEPHEN HUMENIUK
Organization: WARREN LIGHTNING ROD COMPANY
Affilliation: ULPA
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 16:32:43 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-1-NFPA 780-2015

Statement: The Technical Committee makes the change to assist the Authority Having Jurisdiction (AHJ) to maintain sound lightning protection systems.

The Technical Committee does not retain “to the current standard” to enable the AHJ to determine what document edition is to be used for compliance.

The Technical Committee adds “for compliance to this standard” for clarity.

Public Comment No. 54-NFPA 780-2015 [Chapter 2]

Chapter 2 Referenced Publications

2.1 General.

The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 70® , *National Electrical Code®,* 2014 edition.

2.3 Other Publications.

2.3.1 IEC Publications.

International Electrotechnical Commission, 3, rue de Varembé, P.O. Box 131, CH-1211 Geneva 20, Switzerland.

IEC 62305-2, *Protection Against Lightning—Part 2: Risk Management, Edition 2*, 2010.

2.3.2 ISO Publications.

International Organization for Standardization, ISO Central Secretariat, ~~1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20,~~ **BIBC II, 8 , Chemin** de **Blandonnet** , CP **401** , **1214 Vernier, Geneva** Switzerland.

ISO 1496, *Series 1 freight containers — Specification and testing — Part 1: General cargo containers for general purposes*, 2013.

2.3.3 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 1449, *Standard for Safety for Surge Protective Devices*, 4th edition, August 20, 2014.

2.3.4 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 70® , *National Electrical Code®,* 2014 edition.

NFPA 115, *Standard for Laser Fire Protection,* 2012 edition.

Statement of Problem and Substantiation for Public Comment

Updated ISO address.

Related Item

First Revision No. 44-NFPA 780-2014 [Section No. 2.3]

Submitter Information Verification

Submitter Full Name: Aaron Adamczyk
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Sat May 02 15:58:45 EDT 2015

Committee Statement

Committee Action:	Accepted
Resolution:	SR-2-NFPA 780-2015
Statement:	The Technical Committee adds NFPA 61, 122 and 664. See SR-44. The Technical Committee changes the address. Section 2.3 was renumbered. The ISO has changed to this new address.

Public Comment No. 86-NFPA 780-2015 [Section No. 3.3.17]

3.3.17 Grounding Electrode.

The portion of a lightning protection system, such as a ground rod, ground plate electrode, or ground conductor, that ~~is installed for the purpose of allowing~~ allows lightning current ~~flow~~ to flow into the earth.

Statement of Problem and Substantiation for Public Comment

Text changed for readability by the editorial TC

Related Item

First Revision No. 78-NFPA 780-2014 [Section No. 3.3.17]

Submitter Information Verification

Submitter Full Name: STEPHEN HUMENIUK
Organization: WARREN LIGHTNING ROD COMPANY
Affilliation: ULPA
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 08:31:33 EDT 2015

Committee Statement

Committee Action: Rejected

Resolution: The revised definition was discussed during the 1st Draft meeting and this was the text agreed. The subject was discussed in one form or another during the FD meeting and it was agreed that the grounding electrode does not “allow current to flow in the earth” but instead “is installed for the purpose of providing current flow into the earth.” The proposed change is not purely editorial as suggested.

Public Comment No. 62-NFPA 780-2015 [Section No. 3.3.23]

3.3.23 * Light Base.

An enclosure used as (i) a mounting base ~~for airport~~ for airfield light fixtures ~~and assemblies. The unit serves as~~ , (ii) an isolation transformer housing ~~or~~ , (iii) an electrical junction box, or ~~both. The light base is cylindrically shaped, with a closed bottom, provisions for cable or conduit entry and exit, and provisions for grounding, and is provided with a top flange to mate with the fixture or cover~~ (iv) any combination of the foregoing .

Statement of Problem and Substantiation for Public Comment

PI-129 initiated editorial changes to the Light Base definition which resulted in FR-1. The editorial task group discovered an ambiguity in the proposed new definition. This Public Comment is to correct that ambiguity.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 63-NFPA 780-2015 [Section No. A.3.3.23]	

Related Item
First Revision No. 1-NFPA 780-2014 [Section No. 3.3.22]
Public Input No. 129-NFPA 780-2014 [Section No. 3.3.22]

Submitter Information Verification

Submitter Full Name: CARL JOHNSON II
Organization: AVCON INC
Affilliation: none
Street Address:
City:
State:
Zip:
Submittal Date: Sat May 09 11:01:04 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-3-NFPA 780-2015

Statement: The Technical Committee revises the light base definition to provide additional clarification.

The Technical Committee deletes the second sentence as it is explanatory and belongs in the annex; See SR-4.

The Technical Committee deletes “foregoing” and adds “above” for clarity.

Public Comment No. 18-NFPA 780-2015 [New Section after 3.3.25]

3.3.26

3.3.26 Lightning Protection System (for airfield lighting circuits). A complete underground system of counterpoise conductors (guard wires, shield wires), grounding electrodes, bonding jumpers, surge protective devices, and other connectors and fittings required to complete the system.

Statement of Problem and Substantiation for Public Comment

PI-75 provides as a Statement of Problem and Substantiation for Public Input - “As far as I know there are not any underground lightning protection systems. Word differently.”

During the task group’s deliberation on PI-75 the task group decided that a clarification of the definition of a lightning protection system was necessary.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 17-NFPA 780-2015 [Section No. 3.3.25]	
Public Comment No. 19-NFPA 780-2015 [Section No. A.3.3.25]	

Related Item

Public Input No. 75-NFPA 780-2014 [Section No. 11.1.2]

Submitter Information Verification

Submitter Full Name: Carl Johnson II
Organization: AVCON, Inc.
Affilliation: none
Street Address:
City:
State:
Zip:
Submittal Date: Sat Mar 28 13:50:17 EDT 2015

Committee Statement

Committee Action: Unknown Reason

Resolution: The Technical Committee does not see the submitter’s definition revision as necessary. The definition is succinct as used in the document.

Public Comment No. 17-NFPA 780-2015 [Section No. 3.3.25]

3.3.25 * Lightning Protection System (for aboveground structures) .
A complete system of strike termination devices, conductors (which could include conductive structural members), grounding electrodes, interconnecting conductors, surge protective devices, and other connectors and fittings required to complete the system.

Statement of Problem and Substantiation for Public Comment

PI-75 provides as a Statement of Problem and Substantiation for Public Input - “As far as I know there are not any underground lightning protection systems. Word differently.”

During the task group’s deliberation on PI-75 the task group decided that a clarification of the definition of a lightning protection system was necessary.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 18-NFPA 780-2015 [New Section after 3.3.25]	partial public comment to PI-75, LPS definition
Public Comment No. 19-NFPA 780-2015 [Section No. A.3.3.25]	

Related Item

Public Input No. 75-NFPA 780-2014 [Section No. 11.1.2]

Submitter Information Verification

Submitter Full Name: Carl Johnson II
Organization: AVCON, Inc.
Affilliation: none
Street Address:
City:
State:
Zip:
Submittal Date: Sat Mar 28 13:35:48 EDT 2015

Committee Statement

Committee Action: Unknown Reason

Resolution: The Technical Committee does not see the submitter’s definition revision as necessary. The definition is succinct as used is in the document.

Public Comment No. 91-NFPA 780-2015 [Section No. 3.3.28]

3.3.28 Magnetically Shielded.

~~Enclosing all~~ All or part of an object ~~in~~ enclosed in a metallic grid or continuous ~~screen reduces~~ screen which reduce the effects of the lightning electromagnetic pulse (LEMP) and consequently the failure of electronic system components.

Statement of Problem and Substantiation for Public Comment

The text as previously written was an action and not a statement.

Related Item

First Revision No. 25-NFPA 780-2014 [Section No. 3.3.27]

Submitter Information Verification

Submitter Full Name: STEPHEN HUMENIUK
Organization: WARREN LIGHTNING ROD COMPANY
Affilliation: ULPA
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 09:25:53 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-13-NFPA 780-2015
Statement: The Technical Committee makes an editorial change to describe the term rather than the action of implementing it.

Public Comment No. 92-NFPA 780-2015 [Section No. 3.3.37]

3.3.37 * Solar Panel.

A general term for thermal collectors or photovoltaic (PV) modules. ~~Collectors collect heat by absorbing sunlight and are used in water heater systems, parabolic troughs, parabolic-dish type, evacuated-tube type, solar air heaters or solar tower systems. Modules convert solar radiation into direct current (dc) electricity.~~

Statement of Problem and Substantiation for Public Comment

Editorial change made to deleted an explanatory sentence and relocated it to the annex

Related Item

First Revision No. 103-NFPA 780-2014 [New Section after 3.3.32]

Submitter Information Verification

Submitter Full Name: STEPHEN HUMENIUK
Organization: WARREN LIGHTNING ROD COMPANY
Affilliation: ULPA
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 09:45:06 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-37-NFPA 780-2015
Statement: The Technical Committee revises the definition. The last two sentences are relocated to the Annex.

Public Comment No. 98-NFPA 780-2015 [Section No. 4.7.5.2]

4.7.5.2

Such areas shall be permitted to be protected using taller strike termination devices that create zones of protection using the rolling sphere method ~~so the sphere does not contact the flat or gently sloping roof area~~ .

Statement of Problem and Substantiation for Public Comment

The proposed change is primarily editorial. By definition, a zone of protection identifies that the sphere may not contact the flat or gently sloping roof area so the deleted clause is not necessary..

Related Item

First Revision No. 54-NFPA 780-2014 [Section No. 4.7.5]

Submitter Information Verification

Submitter Full Name: MITCHELL GUTHRIE
Organization: ENGINEERING CONSULTANT
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 16:31:59 EDT 2015

Committee Statement

Committee Action: Accepted
Resolution: SR-40-NFPA 780-2015
Statement: The Technical Committee recognizes that a zone of protection exists when the rolling sphere does not contact the roof area.

Public Comment No. 102-NFPA 780-2015 [Section No. 4.7.13.1]

4.7.13.1

Where practicable, movable or rotating objects on roofs shall be placed in a zone of protection by using ~~properly supported long air terminals or lightning protection masts.~~ strike termination devices remote from the movable or rotating object. .

Statement of Problem and Substantiation for Public Comment

The wording of FR57 indicates that movable or rotating objects on roofs can only be protected using long air terminals or masts and does not acknowledge that protection can be provided by “natural” strike termination devices or other techniques that may also provide the necessary protected area. What is important in this clause is that the devices be provided with a protected area that is not attached to the movable object, not that either long air terminals or masts are the only technique allowed.

Related Item

First Revision No. 57-NFPA 780-2014 [Section No. 4.7.13.1]

Submitter Information Verification

Submitter Full Name: MITCHELL GUTHRIE
Organization: ENGINEERING CONSULTANT
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 17:09:01 EDT 2015

Committee Statement

Committee Action: Rejected

Resolution: The Technical Committee recognizes that the strike termination device does not need to be remote from the object and in some cases may be mounted to the object.

Public Comment No. 27-NFPA 780-2015 [Section No. 4.7.13.1]

4.7.13.1

Where practicable, movable or rotating objects on roofs shall be placed in a zone of protection by using properly supported ~~long air terminals or lightning protection masts~~ strike termination devices .

Statement of Problem and Substantiation for Public Comment

The change deleting "such as" now reads that you must only use tall strike terminations or masts, but does not include other items like a catenary. It would be better to say "using strike termination devices", the general term being more inclusive.

Related Item

First Revision No. 57-NFPA 780-2014 [Section No. 4.7.13.1]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 10:53:59 EDT 2015

Committee Statement

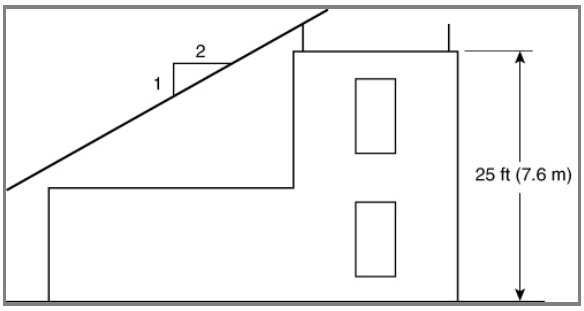
Committee Action: Rejected but see related SR
Resolution: SR-41-NFPA 780-2015
Statement: The Technical Committee recognizes that all strike termination devices can provide a zone of protection, not just air terminals or masts and it understands that the devices must be properly supported.

Public Comment No. 26-NFPA 780-2015 [Section No. 4.8.2.3]

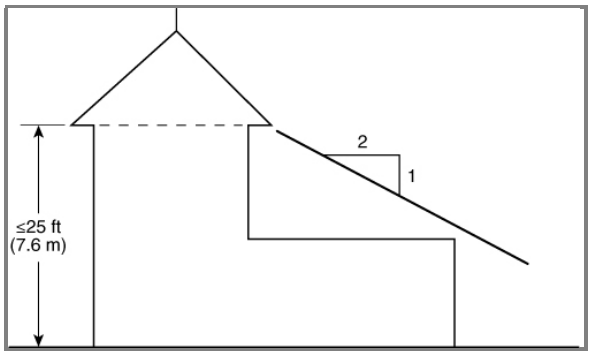
4.8.2.3

Structures that do not exceed 25 ft (7.6 m) above earth shall be considered to protect lower portions of a structure located within a one-to-two zone of protection as shown in Figure 4.8.2.3~~(a)~~ ~~and~~ ~~Figure 4.8.2.3(b)~~ .

Figure 4.8.2.3~~(a) Lower~~ 3 Lower Roof Protection for Flat-Roof Buildings 25 ft (7.6 m) or Less in Height.



~~Figure 4.8.2.3(b) Lower Roof Protection Provided by Pitched-Roof Buildings 25 ft (7.6 m) or Less in Height.~~



Statement of Problem and Substantiation for Public Comment

Figure 4.8.2.3(b) and its caption implies an interpretation of the standard that is not identified anywhere in the standard, Annex, or the handbook for the standard. The committee statement for PI-17 identifies that protected roof levels provide a zone of protection for lower roof levels in accordance with Paragraph 4.8.1. Section 4.8.1 only lists 3 ways to determine the zone of protection and indicates they may be used in combination. Nowhere in any of the sections does the standard indicate that a part of the structure protects another part of the structure unless that part is within the zone of protection provided by a strike termination system. While the requirements of 4.7 allows the ridge conductor to protect the eaves, it does not protect the projected wing below unless that wing is within the zone of protection of the air terminals on the ridge using either the protective angle or rolling sphere method. Clause 3.3.45 defines Zone of Protection as the space adjacent to a lightning protection system that is substantially immune to direct lightning flashes. Clause 4.7 defines the protected area by the placement of strike termination devices. Clause 4.8.2.2 identifies the zone of protection is defined as an angle from “the strike termination device” and Clause 4.8.3 describes the zone of protection is the volume where a sphere is tangent to earth and resting against a strike termination device or supported by two or more strike termination devices. The only place in the standard where a zone of protection is indicated to be from a part of the structure that neither serves as a strike termination device nor has one installed at that location is in Figure 4.8.2.3(b). This appears to be in violation of the Manual of Style so the figure should be deleted or revised.

Related Item

Public Input No. 17-NFPA 780-2014 [Section No. 4.8.2.3]

Submitter Information Verification

Submitter Full Name: MITCHELL GUTHRIE
Organization: ENGINEERING CONSULTANT
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 29 22:59:01 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-42-NFPA 780-2015
Statement: The Technical Committee revises the figure to re-dimension the building height in accordance with 4.8.2.3.

Public Comment No. 55-NFPA 780-2015 [Section No. 4.13.1.1]

4.13.1.1

Each down conductor shall ~~terminate into~~ be terminated by a grounding system using one of the following methods:

(1) A grounding electrode dedicated to the lightning protection system

(2) A grounding electrode system composed of a ground ring electrode as described in 4.13.4

(3) A grounding system composed of a ~~ground ring electrode as described in~~ 4.13.4 ~~,~~ facility ground mesh

(4) It shall be permitted that Methods (3) and (4) be supplemented by multiple grounding electrodes.

Statement of Problem and Substantiation for Public Comment

The change made to 4.13.1.1 had the unintended (I hope) result of undoing the change made in the 2014 Edition which allowed the use of a mesh-type ground grid installed for a facility to also be used to ground the lightning protection system. This proposal will correct the oversight by adding a fourth method to retain the ground mesh as an approved grounding method.

Related Item

Public Input No. 134-NFPA 780-2014 [Section No. 4.13.1.1]

First Revision No. 81-NFPA 780-2014 [Section No. 4.13.1.1]

Submitter Information Verification

Submitter Full Name: MITCHELL GUTHRIE
Organization: ENGINEERING CONSULTANT
Street Address:
City:
State:
Zip:
Submittal Date: Sat May 02 20:29:33 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-14-NFPA 780-2015
Statement: The Technical Committee revises the text to put in list format. Annex text is provided to clarify the grounding electrode requirement.

Public Comment No. 100-NFPA 780-2015 [New Section after 4.13.1.6]

4.13.1.1 A Really Bad Idea

4.13.1.7 Grounding electrodes that will be covered or concealed by the building, structure or finish shall be

accessible.

Statement of Problem and Substantiation for Public Comment

This would be an extremely onerous requirement since ground electrode are required to be buried except where they are installed on solid bed rock. The terms used in the requirement are vague and nebulous. What Constitutes a "finish"? Also, what does "accessible" mean? This requirement would add unnecessary additional cost to the lightning protection system without adding any functional value. There are frequent installation where fill is being used and finish grade is several stories above where the ground electrode is installed. How would cost effective access to that electrode be provided?

Related Item

Committee Input No. 86-NFPA 780-2014 [New Section after 4.13.1.6]

Submitter Information Verification

Submitter Full Name: STEPHEN HUMENIUK
Organization: WARREN LIGHTNING ROD COMPANY
Affilliation: ULPA
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 16:44:49 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-15-NFPA 780-2015

Statement: The Technical Committee provides explanatory text to grounding electrodes to enable their use in maintenance and inspection programs but does not believe the expense is justified for all applications. When accesses to a ground reference point may be covered or otherwise concealed, the new annex material makes it clear that some method of access should be provided but leaves the access method up to the designer so it can be tailored to the local parameters and needs of the test and maintenance plan.

The Technical Committee locates the Annex text in A.4.13.1 as this is more appropriate.

Public Comment No. 57-NFPA 780-2015 [New Section after 4.13.1.6]

4.13.1.7

The grounding electrode system shall have an access point near grade level for future testing of a representative grounding electrode or the complete grounding system. The access point can either be located at a grounding electrode or a low point in the down conductor. Grounding electrode systems or devices covered only by bare earth shall be considered accessible without any addition for testing.

Statement of Problem and Substantiation for Public Comment

CI # 86 for comment by industry
Expands on proposal to allow test points and provides clarificaitons

Related Item

Committee Input No. 86-NFPA 780-2014 [New Section after 4.13.1.6]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 07 10:36:15 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-15-NFPA 780-2015

Statement: The Technical Committee provides explanatory text to grounding electrodes to enable their use in maintenance and inspection programs but does not believe the expense is justified for all applications. When accesses to a ground reference point may be covered or otherwise concealed, the new annex material makes it clear that some method of access should be provided but leaves the access method up to the designer so it can be tailored to the local parameters and needs of the test and maintenance plan.

The Technical Committee locates the Annex text in A.4.13.1 as this is more appropriate.

Public Comment No. 65-NFPA 780-2015 [New Section after 4.13.1.6]

4.13.1.7 Grounding electrodes that will be covered or concealed by the building, structure or finish shall be accessible.

Statement of Problem and Substantiation for Public Comment

I support this proposed change. Lightning protection system components need to be accessible for inspection. Re-inspection of existing systems is not possible if the grounding electrodes are not accessible. We have tried to evaluate a number of existing LPS on older buildings where the grounding electrodes are not accessible.

Related Item

Committee Input No. 86-NFPA 780-2014 [New Section after 4.13.1.6]

Submitter Information Verification

Submitter Full Name: CARL JOHNSON II
Organization: AVCON INC
Affilliation: none
Street Address:
City:
State:
Zip:
Submittal Date: Sat May 09 12:26:17 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-15-NFPA 780-2015

Statement: The Technical Committee provides explanatory text to grounding electrodes to enable their use in maintenance and inspection programs but does not believe the expense is justified for all applications. When accesses to a ground reference point may be covered or otherwise concealed, the new annex material makes it clear that some method of access should be provided but leaves the access method up to the designer so it can be tailored to the local parameters and needs of the test and maintenance plan.

The Technical Committee locates the Annex text in A.4.13.1 as this is more appropriate.

Public Comment No. 30-NFPA 780-2015 [Section No. 4.13.8.3.2]

4.13.8.3.2

Ground rods in accordance with 4.13.2, ground ring electrodes in accordance with 4.13.4, radials in accordance with 4.13.5, or ground plate electrodes in accordance with 4.13.6 shall be installed below the structure in compacted ~~earth and made tight~~ earth tight against the electrode.

Statement of Problem and Substantiation for Public Comment

The wording "and made tight" indicates once the ground device is installed the earth is then moved into position. This doesn't make sense, but neither does using a term like driven into "undisturbed earth, because in this case we are talking about earth under the structure that was probably disturbed and reconfigured during the construction process. This seems the best resolution on the intent.

Related Item

First Revision No. 145-NFPA 780-2014 [Sections 4.18.4.1, 4.18.4.2]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 11:19:50 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-16-NFPA 780-2015
Statement: The TC modifies the text for clarification of the intent of the requirement by confirming that that the grounding system can consist of combinations of electrodes.

Public Comment No. 58-NFPA 780-2015 [New Section after 4.16.2]

4.16.3

4.16.3 Long, Horizontal Metal Bodies on Roofs. Long horizontal **grounded** metal bodies on roofs shall be bonded in accordance with 4.16.3.1 through 4.16.3.3.

4.16.3.1 Grounded ~~and ungrounded~~ metal bodies on roofs exceeding 60 ft. in horizontal length shall be bonded to the lightning protection system as near as practicable to their extremities unless inherently bonded through construction at those locations.

4.16.3.2 Horizontal **grounded** metal bodies that are parallel to a main lightning conductor and that are within the bonding distance calculated in 4.16.2.4 or 4.16.2.5 shall be bonded to the main conductor at intervals averaging not more than 100 ft. (30 m) along the main conductor unless inherently bonded through construction at those locations.

4.16.3.3 Horizontal **grounded** metal bodies that cross a main conductor shall be bonded to the main conductor where they cross the conductor unless inherently bonded through construction at that location.

Statement of Problem and Substantiation for Public Comment

CI # 93 for industry comment
There are ungrounded metal bodies on roofs or at roof level, exceeding 60 feet in length, that are not a hazard. They are under the zone of protection, beyond the calculated bonding distance, and do not serve as a path to alternate grounded systems. Like the gutter on the back side of my house. Bonding items like this would waste material and labor for no real purpose.

Related Item

Committee Input No. 93-NFPA 780-2014 [New Section after 4.16.2.5.2]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 07 10:46:02 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-17-NFPA 780-2015
Statement: The Technical Committee adds new text as a result of CI-93 to focus on grounded horizontal metal bodies.

Public Comment No. 64-NFPA 780-2015 [New Section after 4.16.2.5.2]

Committee Input No. 93-NFPA 780-2014 [New Section after 4.16.2.5.2]

4.16.3 Long, Horizontal Metal Bodies on Roofs. **Long, horizontal metal bodies on roofs shall be bonded in accordance with** 4.16.3.1 **through** 4.16.3.3 **.**

4.16.3.1 **Grounded and ungrounded metal bodies on roofs exceeding 60 ft (18 m) in horizontal length shall be bonded to the lightning protection system as near as practicable to their extremities unless inherently bonded through construction at those locations.**

4.16.3.2 **Horizontal metal bodies that are parallel to a main lightning conductor and that are within the bonding distance calculated in 4.16.2.4 or 4.16.2.5 shall be bonded to the main conductor at intervals averaging not more than 100 ft (30 m) along the main conductor unless inherently bonded through construction at those locations.**

4.16.3.3. **Horizontal metal bodies that cross a main conductor shall be bonded to the main conductor where they cross the conductor unless inherently bonded through construction at that location.**

Statement of Problem and Substantiation for Public Comment

I support Committee Input No. 93. The proper bonding of long horizontal metallic items on a roof is an important feature of a quality LPS.

Related Item

Committee Input No. 93-NFPA 780-2014 [New Section after 4.16.2.5.2]

Submitter Information Verification

Submitter Full Name: CARL JOHNSON II
Organization: AVCON INC
Affilliation: none
Street Address:
City:
State:
Zip:
Submittal Date: Sat May 09 12:20:56 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-17-NFPA 780-2015

Statement:	The Technical Committee adds new text as a result of CI-93 to focus on grounded horizontal metal bodies.

Public Comment No. 101-NFPA 780-2015 [New Section after 4.16.3.1]

4.16.3 Long, Horizontal Metal Bodies on Roofs. **Long, horizontal metal bodies on roofs shall be bonded in accordance with** 4.16.3.1 **through** 4.16.3.3 **.**

4.16.3.1 **Grounded and ungrounded metal bodies on roofs exceeding 60 ft (18 m) in horizontal length shall be bonded to the lightning protection system as near as practicable to their extremities unless inherently bonded through construction at those locations.**

4.16.3.2 **Horizontal metal bodies that are parallel to a main lightning conductor and that are within the bonding distance calculated in 4.16.2.4 or 4.16.2.5 shall be bonded to the main conductor at intervals averaging not more than 100 ft (30 m) along the main conductor unless inherently bonded through construction at those locations.**

4.16.3.3. **Horizontal metal bodies that cross a main conductor shall be bonded to the main conductor where they cross the conductor unless inherently bonded through construction at that location.**

Statement of Problem and Substantiation for Public Comment

The current requirements of the standard do not differentiate between vertical or horizontal metal bodies and are applicable to both. As written, further substantiation would need to be provided to justify the additional requirements.
This would be best considered in a future revision cycle.

Related Item

Committee Input No. 93-NFPA 780-2014 [New Section after 4.16.2.5.2]

Submitter Information Verification

Submitter Full Name: STEPHEN HUMENIUK
Organization: WARREN LIGHTNING ROD COMPANY
Affilliation: ULPA
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 17:03:52 EDT 2015

Committee Statement

Committee Action: Rejected
Resolution: The Technical Committee recognizes the need for bonding of horizontal metal bodies on roofs.

Public Comment No. 28-NFPA 780-2015 [Section No. 4.16.3.3.2]

4.16.3.3.2
The bonding connection shall be permitted to be made from the lightning protection system to the ungrounded metal body and from ~~the isolated~~ the ungrounded metal body to the grounded metal body.

Statement of Problem and Substantiation for Public Comment

4.16.3.3.2 The bonding connection shall be permitted to be made from the lightning protection system to the ungrounded metal body and from the "isolated" ungrounded metal body to the grounded metal body. The last use of term "isolated" was not changed to "ungrounded". This was in the PI, but not the FR.

Related Item

First Revision No. 92-NFPA 780-2014 [Section No. 4.16.3]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 11:00:59 EDT 2015

Committee Statement

Committee Action: Accepted
Resolution: SR-18-NFPA 780-2015
Statement: The Technical Committee changes "isolated" to "ungrounded" for consistency throughout the document. The last use of the term "isolated" was not changed to "ungrounded" as agreed in FR-92.

Public Comment No. 29-NFPA 780-2015 [Section No. 4.16.4]

4.16.4 Materials.

Conductors used for the bonding of grounded metal bodies ~~or isolated~~ or ungrounded metal bodies requiring connection to the lightning protection system shall be sized in accordance with bonding conductor requirements in Table 4.1.1.1.1 and Table 4.1.1.1.2.

Statement of Problem and Substantiation for Public Comment

use of the term "isolated" was removed from all sections of the document where the term "ungrounded" would better define the metal body in question - with the exception of this paragraph which was missed in the original FR set.

Related Item

First Revision No. 92-NFPA 780-2014 [Section No. 4.16.3]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 11:07:58 EDT 2015

Committee Statement

Committee Action: Accepted
Resolution: SR-19-NFPA 780-2015
Statement: The Technical Committee changes "isolated" to "ungrounded" for consistency throughout the document. This change was mistakenly overlooked in the FR implementation of FR-92. An editorial revision is included to reduce the redundant “metal bodies.”

Public Comment No. 103-NFPA 780-2015 [New Section after 4.20.4]

4.20.4 * **Measured Limiting Voltage of an SPD.**

The published voltage protection rating (VPR) for each mode of protection shall be selected to be no greater than those given in Table 4.20.4 for the different power distribution systems to which they can be connected.

Table 4.20.4 Maximum Allowed Voltage Protection Rating per Mode of Protection Provided for Different Power Distribution Systems to Which the SPD Can Be Connected

Power Distribution System	Line-to-Neutral	Line-to-Ground	Neutral-to-Ground	Line-to-Line
120 2W ground	600	700	700	600
240 2W ground	1000	1000	1000	—
120/240 3W ground	600	700	700	600
120/208 WYE 4W ground	600	700	700	600
277/480 WYE 4W ground	1200	1200	1200	1800
277/480 WYE 4W HRG (high resistance ground)	1200	1200	1200	1800
347/600 WYE 4W ground	1800	1800	1800	4000
240 DELTA 3W ground (corner grounded)	—	1000	—	1000
240 DELTA 3W (ungrounded)	—	1000	—	1000
480 DELTA 3W ground (corner grounded)	—	1800	—	1800
480 DELTA 3W (ungrounded)	—	1800	—	1800

Statement of Problem and Substantiation for Public Comment

The values on the chart should be left as they are. The current values do not have a history of failure. Additional there are few devices on the market that are design to these value. These new values would add new requirements and unnecessary expense.

Related Item

Committee Input No. 21-NFPA 780-2014 [Section No. 4.20.4]

Submitter Information Verification

Submitter Full Name: STEPHEN HUMENIUK
Organization: WARREN LIGHTNING ROD COMPANY
Affilliation: ULPA
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 17:32:26 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR

Resolution: The Technical Committee does not agree with the submitter of the PC to leave the values unchanged from the 2014 edition. The Technical Committee contends that there is minimal safety risk associated with increasing the allowed VPR for 120 V power distribution system SPDs' Line-to-Neutral and Neutral-to-Ground modes. The Technical Committee edits 6 values in the table.

Statement: The TC changes 600 to 700 in 6 places. See attachment.

Public Comment No. 104-NFPA 780-2015 [Section No. 5.3]

5.3 ~~– Grain-, Coal-, and Coke-Handling and -Processing Structures. Provisions shall be made for~~

F acilities that Handle or Process Combustible or Explosive Dust.

5.3.1 Provisions shall be made for grain elevators and other food processing facilities to prevent ignition of combustible dust in accordance with this standard and NFPA 61 *Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities* .

5.3.2 Provisions shall be made for coal and coke processing faciliries to prevent ignition of combustible dust in accordance with this standard and NFPA 122 *Standard for Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities* .

5.3.3 Provisions shall be made for the settling and rising of wood frame elevators as grain, coal, and coke are loaded and unloaded.

5.3.4 Provisions shall be made for wood working facilities to prevent ignition of combustible dust in accordance with this standard and NFPA 664 *Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities* .

Statement of Problem and Substantiation for Public Comment

The text covers additional facilities' that are susceptible to fire and explosion from a lightning strike.

Related Item

Committee Input No. 64-NFPA 780-2014 [Section No. 5.3]

Submitter Information Verification

Submitter Full Name: STEPHEN HUMENIUK
Organization: WARREN LIGHTNING ROD COMPANY
Affilliation: ULPA
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 17:39:06 EDT 2015

Committee Statement

Committee Action: Accepted
Resolution: SR-44-NFPA 780-2015
Statement: The Technical Committee expands the text to include other hazards not currently addressed.

Public Comment No. 31-NFPA 780-2015 [Section No. 5.9.4.2]

5.9.4.2
A ground grid shall be installed under the fabric structure in accordance with Annex G - Section G .1.1.3.

Statement of Problem and Substantiation for Public Comment

5.9.4.2 "A ground grid shall be installed under the fabric structure." A reference to what is considered a ground grid is needed. The reference in the 2014 document is in Annex G.1.1.3. I am not sure, however, if we can reference Annex material in the requirements or the information in G.1.1.3 might need to be moved up to this section of Chapter 5.

Related Item

First Revision No. 65-NFPA 780-2014 [New Section after 5.8.7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 11:33:37 EDT 2015

Committee Statement

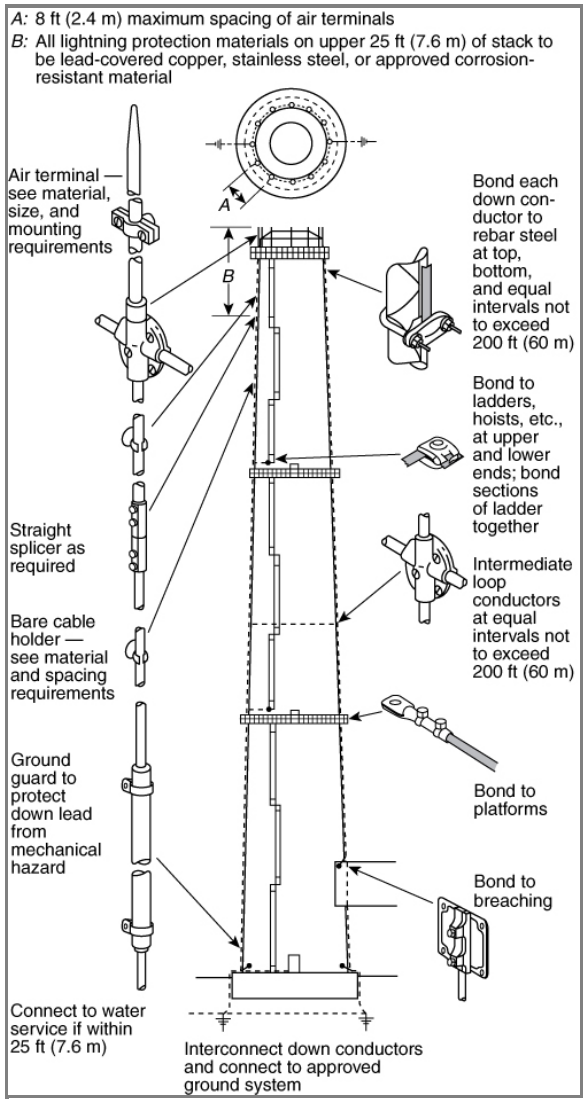
Committee Action: Rejected but see related SR
Resolution: SR-45-NFPA 780-2015
Statement: Providing information from Annex G as requirements in 5.9.4.2 has not had the opportunity for public review. The TC adds annex text to provide a reference to Annex G - Section G .1.1.3.

Public Comment No. 32-NFPA 780-2015 [Section No. 6.1]

6.1 General.

A smoke or vent stack as shown in Figure 6.1 shall be classified as heavy duty if the cross-sectional area of the flue is greater than 500 in.^{2} (0.3 m^2) and the height is greater than 75 ft (23 m), above ~~ground level~~ grade level .

Figure 6.1 Heavy-Duty Stack.



Statement of Problem and Substantiation for Public Comment

The term "ground level" could be interpreted to mean grade level, ground floor level, or the level of the highest ground loop - possibly a roof circuit. Reference to the illustration of a free-standing stack would indicate the height is determined above grade.

Related Item

First Revision No. 149-NFPA 780-2014 [Section No. 6.1]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE

Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 12:39:23 EDT 2015

Committee Statement

Committee Action: Accepted
Resolution: SR-46-NFPA 780-2015
Statement: The Technical Committee uses the term “grade level” to clarify the requirement.

Public Comment No. 35-NFPA 780-2015 [Section No. 7.2.3]

7.2.3 Lightning Protection System.

~~Protection of structures not considered inherently protected as per~~ Structures not inherently protected per 7.2.2 shall be ~~protected in~~ provided with protection in accordance with the requirements of Section 7.3 except as ~~modified by requirements for~~ modified for specific types of structures *(see Section 7.4)*.

Statement of Problem and Substantiation for Public Comment

The sentence is confusing as presented.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 15:29:20 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-28-NFPA 780-2015
Statement: The Technical Committee revises the text to provide for clarification of intent.

Public Comment No. 36-NFPA 780-2015 [Section No. 7.3.3.2]

7.3.3.2 * _

The placement of strike termination devices shall take into consideration that it is possible for sparks or damaging impact to occur at the ~~striking point~~ attachment point .

Statement of Problem and Substantiation for Public Comment

Matches existing text throughout the document.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 15:34:10 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-29-NFPA 780-2015
Statement: The Technical Committee changes the text as the attachment point is the terminology used in the document.

Public Comment No. 85-NFPA 780-2015 [Section No. 7.3.3.2]

7.3.3.2 * _

The placement of strike termination devices shall take into consideration that it is possible for sparks or damaging impact to occur at ~~the striking~~ the attachment point.

Statement of Problem and Substantiation for Public Comment

Editorial. Attachment point is the preferred term in the standard.

Related Item

Public Input No. 218-NFPA 780-2014 [Sections 7.1, 7.2, 7.3]

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: MITCHELL GUTHRIE
Organization: ENGINEERING CONSULTANT
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 08:06:31 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-29-NFPA 780-2015
Statement: The Technical Committee changes the text as the attachment point is the terminology used in the document.

Public Comment No. 37-NFPA 780-2015 [Section No. 7.3.4.3]

~~7.3.4.3 –~~
~~Where it is not practicable to install down conductors external to the hazardous location it shall be ensured that the auto-ignition temperature for the gas or vapor causing the hazardous environment is not exceeded.~~

Statement of Problem and Substantiation for Public Comment

It is not practical to include this requirement without identifying for the user a method to calculate the temperature of the down conductor for comparison to the ignition temperature of the hazardous location. If the temperature can not be quantified based on design or material variability, then open down conductors should not be used in this environment. They should be run in hazardous area qualified enclosures.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 15:40:31 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-30-NFPA 780-2015
Statement: The Technical Committee adds annex text providing a minimum auto-ignition temperature of the hazardous (classified) location where an exposed conductor may be installed. This temperature is based on estimated maximum temperature of a Class I conductor.

Public Comment No. 59-NFPA 780-2015 [Section No. 7.3.7]

7.3.7 * Grounding.

A ground ring electrode or ground loop conductor supplemented by grounding electrodes as identified in 4.13.2 through 4.13.7 shall be provided for structures containing flammable vapors, flammable gases, or liquids that can give off flammable vapors.

Move this paragraph to Chapter 5 or be more specific that this particular paragraph doesn't apply to storage tanks. Storage tank grounding is handled lower in this Chapter and this could be viewed by reader as confusing or in conflict with another paragraph within this same chapter.

Statement of Problem and Substantiation for Public Comment

Because grounding for tanks is addressed within this same chapter. Having it twice without direction could be confusing.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: MORRIS KLINE
Organization: LIGHTNING MASTER CORPORATION
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 08 09:26:22 EDT 2015

Committee Statement

Committee Action: Unknown Reason

Resolution: Chapter 5 does not apply to structures containing flammable vapors, flammable gases, or liquids that can give off flammable vapors. The scope of Chapter 7 is all structures containing flammable vapors, flammable gases, or liquids that can give off flammable vapors, not just storage structures such as tanks. Section 7.3 deals with general protective measures for structures containing flammable vapors, flammable gases, or liquids that can give off flammable vapors. 7.4.3 provides specific requirements for Aboveground Tanks at Atmospheric Pressure Containing Flammable Vapors or Liquids That Give Off Flammable Vapors. 7.4.3.7 provides specific grounding requirements for these tanks that provides implementation details specific to this type structure.

Public Comment No. 38-NFPA 780-2015 [Section No. 7.4.1.1]

7.4.1.1

Structures containing hazardous (classified) locations used in nonstorage applications shall comply with the requirements of Section 7. ~~3 unless justified by a lightning risk assessment~~ 2 .

Statement of Problem and Substantiation for Public Comment

Non-storage structures that include hazardous areas are typically processing structures that need protection.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 15:57:29 EDT 2015

Committee Statement

Committee Action: Rejected

Resolution: It is agreed that most processing structures will require an LPS but this will be confirmed by the lightning risk assessment. The References Task Group has identified several standards where a structure likely contains a hazardous (classified) location that may require lightning protection and has recommended a revision to include a requirement that lightning protection be provided unless justified by a lightning risk assessment. It is better to consider lightning as a threat and determine whether protection is required than not consider protection at all.

Public Comment No. 39-NFPA 780-2015 [Section No. 7.4.1.2]

~~7.4.1.2~~ ~~*~~ - –

~~For structures in which the hazardous (classified) location exists in only one part of the structure, it shall be permitted for a risk assessment to utilize the lightning protection zone (LPZ) concept in accordance with IEC 62305-2, *Protection Against Lightning—Part 2: Risk Management* .~~

Statement of Problem and Substantiation for Public Comment

Structures that include hazardous locations should have lightning protection.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 16:14:15 EDT 2015

Committee Statement

Committee Action: Rejected

Resolution: For structures with locations that appear in only part of a structure may require an LPS but this will be confirmed by the lightning risk assessment. The References Task Group has identified several standards where a structure likely contains a hazardous (classified) location that may require lightning protection and has recommended a revision to include a requirement that lightning protection be provided unless justified by a lightning risk assessment. It is better to consider lightning as a threat and determine whether protection is required than not consider protection at all.

Public Comment No. 40-NFPA 780-2015 [Section No. 7.4.2.1]

7.4.2.1

~~It shall be permitted for the authority having jurisdiction to waive the requirements of this chapter for sealed~~ Sealed metallic tanks, vessels, and process equipment that contain flammable or combustible liquids or flammable gases under pressure are considered to be inherently self-protecting provided the vessel is grounded (either inherently or by external means) and the walls of the vessel are greater than 3⁄16 in. (4.8 mm) thick to prevent puncture by a direct strike in accordance with 7 .2.2.

Statement of Problem and Substantiation for Public Comment

The AHJ can always waive requirements - this does not need to be included here. This statement is already included in 7.2.2, but can be re-emphasized here for this type vessel.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 16:19:35 EDT 2015

Committee Statement

Committee Action: Accepted
Resolution: SR-31-NFPA 780-2015
Statement: The Technical Committee deletes the text because the AHJ can always waive requirements - this does not need to be included here. This statement is already included in 7.2.2, but can be re-emphasized here for this type vessel.

Public Comment No. 53-NFPA 780-2015 [New Section after 7.4.2.2]

Add new 7.4.2.2* as follows and renumber existing 7.4.2.2 as 7.4.2.3.

The decision to waive the requirements for protection of storage tanks under pressure shall take into consideration the temperature rise of the internal surface of lightning attachment points and the ignition temperature of the contents of the tank.

Statement of Problem and Substantiation for Public Comment

7.4.2.1 addresses the issue of burn-through but does not address the issue of hot spots on internal surfaces resulting from the arc root temperature at the attachment point. The proposed new text addresses this issue.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 95-NFPA 780-2015 [New Section after A.7.4.1.2]	
Public Comment No. 97-NFPA 780-2015 [Section No. O.1.2.8]	

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: MITCHELL GUTHRIE
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City:
State:
Zip:
Submittal Date: Thu Apr 30 18:01:14 EDT 2015

Committee Statement

Committee Action: Rejected
Resolution: The submitter introduces new material that has not had the opportunity for public review.

Public Comment No. 41-NFPA 780-2015 [Section No. 7.4.3.1]

7.4.3. ~~1~~ 5 * _ Fixed Roof Tanks (Metallic) and Tanks with Internal Floating Roofs.
Sliding or fixed contact conductors shall not be mandatory for lightning protection for fixed roof and internal floating roof tanks.

Statement of Problem and Substantiation for Public Comment

This section is misplaced in the document. You should first define what sliding and fixed contacts are, then it makes sense that you don't need these on a fixed roof tank. I've shown moving it back to 7.4.3.5 to put it before Metallic tanks with nonmetallic roofs, because in reality everything moves up one number if it is deleted as 7.4.3.1.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 16:30:43 EDT 2015

Committee Statement

Committee Action: Unknown Reason
Resolution: The Technical Committee confirms that the existing location of the requirement is correct.

Public Comment No. 43-NFPA 780-2015 [Section No. 7.4.3.2.2.1]

7.4.3.2.2.1

The shunt shall have as short and direct a path as possible from the conductive floating roof to the tank shell.

(A) _

The shunts shall be of the minimum length necessary to permit the function of the floating roof assembly.

(B) _

The shunts shall be of the minimum length necessary to remain in contact with the shell during the full horizontal and vertical design movement of the floating roof.

Statement of Problem and Substantiation for Public Comment

Paragraph 7.4.3.2.2.7 describes shunt length, as does 7.4.3.2.2.1. They should be combined.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 16:47:37 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-50-NFPA 780-2015
Statement: The Technical Committee remunerates various requirements from 7.3.7 through 7.4.4.2. This is to correct paragraph misplacement from FR-146 which restructured Chapter 7 in its entirety. The Annex text is also renumbered.

Public Comment No. 3-NFPA 780-2015 [Section No. 7.4.3.2.2.3]

7.4.3.2.2.3

Above-deck shunts shall be removed when retrofitting existing tanks with submerged shunts.

Add caution note "consult with seal manufacturer prior to removal of above-deck shunts". Some seal manufacturers could be using shunts as part of their seal system.

Statement of Problem and Substantiation for Public Comment

Because seal manufactures have be providing shunts for static electricity control, they may need to be consulted prior to shunt removal.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: Morris Kline
Organization: Lightning Master Corporation
Street Address:
City:
State:
Zip:
Submittal Date: Tue Feb 24 08:17:21 EST 2015

Committee Statement

Committee Action: Unknown Reason
Resolution: The submitter introduces new material that has not had the opportunity for public review.

Public Comment No. 42-NFPA 780-2015 [Section No. 7.4.3.2.2.3]

7.4.3.2.2. ~~3~~ 8
Above-deck shunts shall be removed when retrofitting existing tanks with submerged shunts.

Statement of Problem and Substantiation for Public Comment

This paragraph is out of place. The other paragraphs describe the shunt, but this paragraph requires removal of above deck shunts. it doesn't fit here.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 16:42:52 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-50-NFPA 780-2015
Statement: The Technical Committee remunerates various requirements from 7.3.7 through 7.4.4.2. This is to correct paragraph misplacement from FR-146 which restructured Chapter 7 in its entirety. The Annex text is also renumbered.

Public Comment No. 44-NFPA 780-2015 [Section No. 7.4.3.2.2.7]

~~7.4.3.2.2.7 – Shunt Length.~~

~~(A) –~~

~~The shunts shall be of the minimum length necessary to permit the function of the floating roof assembly.~~

~~(B) –~~

~~The shunts shall be of the minimum length necessary to remain in contact with the shell during the full horizontal and vertical design movement of the floating roof.~~

Statement of Problem and Substantiation for Public Comment

Moved to 7.4.3.2.2.1

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 16:50:58 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-50-NFPA 780-2015
Statement: The Technical Committee remunerates various requirements from 7.3.7 through 7.4.4.2. This is to correct paragraph misplacement from FR-146 which restructured Chapter 7 in its entirety. The Annex text is also renumbered.

Public Comment No. 45-NFPA 780-2015 [Section No. 7.4.3.2.2.8]

~~7.4.3.2.2.8~~ * - –

~~The shunts and terminations shall be of sufficient flexibility, cross-sectional area, and corrosion resistance to maximize service life.~~

Statement of Problem and Substantiation for Public Comment

This information is already in 7.4.3.2.2.4 & 7.4.3.2.2.5.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 16:53:39 EDT 2015

Committee Statement

Committee Action: Rejected

Resolution: The Technical Committee contends that the information is required and is not contained in other sections of the document.

Public Comment No. 46-NFPA 780-2015 [Section No. 7.4.3.3.1]

7.4.3.3.1

The tank's floating roof shall be bonded to the tank shell by direct electrical connection ~~such as a bypass~~ with a Class I main size bypass conductor.

Statement of Problem and Substantiation for Public Comment

The size of the bypass conductor needs to be defined.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 16:56:13 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-33-NFPA 780-2015
Statement: The Technical Committee defines the minimum size conductor required.

Public Comment No. 47-NFPA 780-2015 [Section No. 7.4.3.3.4]

7.4.3.3.4

A minimum of two bypass ~~conductors shall be evenly spaced not more than every~~ conductors evenly spaced on the perimeter shall be provded for all tanks, and an additional bypass conductor shall be provided for every 100 ft (30 m) around the tank circumference.

Statement of Problem and Substantiation for Public Comment

The intent of the current wording is not clear.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 17:00:11 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-34-NFPA 780-2015
Statement: The Technical Committee revises the text to provide greater clarity.

Public Comment No. 48-NFPA 780-2015 [Section No. 7.4.3.3.5.1]

7.4.3.3.5.1

~~A minimum of one bypass~~ A Class I main size bypass conductor shall be installed along and bonded to the rolling ladder~~, if installed~~ .

Statement of Problem and Substantiation for Public Comment

Clarifies the intent this is a current carrying part of the system.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 17:11:56 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-35-NFPA 780-2015
Statement: The Technical Committee edits the text to add clarity.

Public Comment No. 60-NFPA 780-2015 [Section No. 7.4.3.4.1]

7.4.3.4.1

Any non–fully submerged conductive seal assembly components, including springs, scissor assemblies, and seal membranes, shall be electrically insulated from the tank roof.

This requirement is not practical or achievable in the field. Any assembly that is missed would make the situation worse. The use of bonding straps as described in Section 7.4.3.2.1.1 should handle this issue.

Statement of Problem and Substantiation for Public Comment

This is handled in another Section of this Chapter (7.4.3.2.1.1

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: MORRIS KLINE
Organization: LIGHTNING MASTER CORPORATION
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 08 10:54:36 EDT 2015

Committee Statement

Committee Action: Rejected
Resolution: The submitter provides new material that has not had the opportunity of public review.

Public Comment No. 4-NFPA 780-2015 [Section No. 7.4.3.5.1]

7.4.3.5.1

Any gauge or guide pole components or assemblies that penetrate the tank's floating roof shall be electrically insulated from the tank's floating roof.

Another method would be to provide seal assembly around guage or guide pole to reduce vapor escape. Otherwise, how can electrical insulation be achieved? This paragraph is not achievable!

Statement of Problem and Substantiation for Public Comment

There is no method of insulating these item.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: Morris Kline
Organization: Lightning Master Corporation
Street Address:
City:
State:
Zip:
Submittal Date: Tue Feb 24 08:31:55 EST 2015

Committee Statement

Committee Action: Rejected
Resolution: The submitter provides new material that has not had the opportunity of public review.

Public Comment No. 49-NFPA 780-2015 [Section No. 7.4.3.6.1]

7.4.3.6.1

~~Such tanks shall be provided with strike termination devices~~ The roof area of these tanks shall be placed under a zone of protection .

Statement of Problem and Substantiation for Public Comment

Air terminals are one way to place the roof under a zone of protection, but other methods may be used - such as an overhead line system.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 17:15:50 EDT 2015

Committee Statement

Committee Action: Rejected
Resolution: The submitter provides new material that has not had the opportunity of public review.

Public Comment No. 50-NFPA 780-2015 [Section No. 7.4.3.6.2]

7.4.3.6.2

~~Such strike~~ Strike termination devices mounted to the roof shall be ~~bonded to each other,~~ interconnected by main size conductor, bonded to the metallic sheathing, if any, and connected to the tank shell with main size conductor.

Statement of Problem and Substantiation for Public Comment

Better describes the intent.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 17:19:24 EDT 2015

Committee Statement

Committee Action: Rejected
Resolution: This proposal introduces action on text that was not modified in the FD nor were there any FD actions that affect the proposed change

Public Comment No. 51-NFPA 780-2015 [Section No. 7.4.3.6.4]

~~7.4.3.6.4~~ –

~~Any of the following strike termination devices shall be permitted to be used:~~

(1) - ~~Conducting masts~~

(2) - ~~Overhead ground wires~~

(3) - ~~Combination of masts and overhead ground wires~~

Statement of Problem and Substantiation for Public Comment

To be correct, you would need to add air terminals to the list of approved strike termination devices available for use, but if you do that, you have just named the full set of strike termination devices, so there is no real reason for this paragraph.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 17:24:49 EDT 2015

Committee Statement

Committee Action: Accepted
Resolution: SR-47-NFPA 780-2015
Statement: The Technical Committee does not want to restrict the type of strike termination devices that may be used.

Public Comment No. 5-NFPA 780-2015 [Section No. 7.4.4]

7.4.4 Earthen Containers at Atmospheric Pressure Containing Flammable Vapors or Liquids That Give Off Flammable Vapors.

7.4.4.1

Lined or unlined earthen containers with combustible roofs that enclose flammable vapors or liquids that can give off flammable vapors shall be protected by air terminals, separate masts, overhead ground wires, or a combination of these devices.

7.4.4.2

Aboveground nonmetallic tanks shall be protected as described in 7.3.2.

Consider moving this section to Chapter 5.

Statement of Problem and Substantiation for Public Comment

Unlined earthen containers really belong in Chapter 5

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: Morris Kline
Organization: Lightning Master Corporation
Street Address:
City:
State:
Zip:
Submittal Date: Tue Feb 24 08:38:20 EST 2015

Committee Statement

Committee Action: Rejected

Resolution: There is no justification for the suggestion that this clause belongs in Chapter 5. Chapter 5 covers Protection for Miscellaneous Structures and Special Occupancies. Chapter 7 covers Protection for Structures Containing Flammable Vapors, Flammable Gases, or Liquids That Can Give Off Flammable Vapors. Clause 7.4.4 addresses Containers at Atmospheric Pressure Containing Flammable Vapors or Liquids That Give off Flammable Vapors. It clearly belongs in Chapter 7.

Public Comment No. 52-NFPA 780-2015 [Section No. 7.4.4.2]

7.4.4.2

Aboveground nonmetallic tanks shall be protected as described in 7.3. ~~2.~~

Statement of Problem and Substantiation for Public Comment

7.3.2 only refers to the zone of protection calculation. Above ground non-metallic tanks would be subject to all requirements of 7.3 - STDs, down conductors, bonding, surge, & grounding.

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 17:29:04 EDT 2015

Committee Statement

Committee Action: Accepted
Resolution: SR-48-NFPA 780-2015
Statement: The Technical Committee confirms all of Clause 7.3 is applicable for aboveground nonmetallic tanks.

Public Comment No. 87-NFPA 780-2015 [Section No. 8.5.3.1]

8.5.3.1

Metallic masses ~~with a~~ shall not be required to be bonded if the mass has:

(1) A surface area of less than 400 in.^{2} (0.~~26 m~~ 26m ^{2})~~ or a~~

(2) A volume of less than 1000 in.^{3} (1.64 ~~× 104~~ x 1.04 cm^3)~~ shall not be required to be bonded.~~

Statement of Problem and Substantiation for Public Comment

Text was changed to comply with MOS section 1.8.1

Related Item

First Revision No. 33-NFPA 780-2014 [Section No. 8.5.3]

Submitter Information Verification

Submitter Full Name: STEPHEN HUMENIUK
Organization: WARREN LIGHTNING ROD COMPANY
Affilliation: ULPA
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 08:59:12 EDT 2015

Committee Statement

Committee Action: Unknown Reason
Resolution:
Statement: The Technical Committee changes the text to comply with MOS 1.8.1 and corrects the conversion corrected values (0.26 m2 instead of 26 m2) and added superscripts where applicable. The Technical Committee uses m3 rather than cm3.

Public Comment No. 73-NFPA 780-2015 [Sections 8.7.1.1, 8.7.1.2]

Sections 8.7.1.1, 8.7.1.2

8.7.1.1

Air terminals shall be placed on the headwall ~~, the rear ventilator~~ and any ventilator or other metal bodies (if present)~~, and at~~ . Air terminals on the perimeter or down the center of the ~~magazine roof as required to obtain a 100 ft (30 m) radius zone of protection~~ igloo are not required if a minimum of two feet of earth covering is maintained .

8.7.1.2

~~Tall air terminals in the center of the magazine headwall and roof shall be permitted in lieu of perimeter air terminals only if they provide adequate protection in accordance with 8.2.1 .~~ DELETE

Statement of Problem and Substantiation for Public Comment

NFPA 780 mandates the requirement for air terminals either on the perimeter or down the spine of Earth Covered Magazines (ECM) which drives issues for existing ECMs not built to this requirement and ones currently in design for construction. This requirement drives in the neighborhood of 18 additional Air terminals for 80' ECMs over that of the 5 which were the previous guidance (2011 & 2014 versions). Additionally; there was no grandfather clause placed in the NFPA which drives the potential cost for millions of dollars to bring existing LPS up to code on the ~170 ECMs here at Hill AFB. Current opinions/views of local engineers and USAF/AFCEC LPS Engineer (Ms. Campbell) is that this is a misinterpretation of the guidance and LPS is not required to protect the earth covered portions of an ECM.

Related Item

Public Input No. 1-NFPA 780-2013 [Global Input]

Submitter Information Verification

Submitter Full Name: james nudd
Organization: USAF
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 13 10:57:34 EDT 2015

Committee Statement

Committee Action: Accepted

Resolution: SR-51-NFPA 780-2015

Statement: NFPA 780 mandates the requirement for air terminals either on the perimeter or down the spine of Earth Covered Magazines (ECM) which drives issues for existing ECMs not built to this requirement and ones currently in design for construction. This requirement drives in the neighborhood of 18 additional Air terminals for 80' ECMs over that of the 5 which were the previous guidance (2011 & 2014 versions). Additionally; there was no grandfather clause placed in the NFPA which drives the potential cost for millions of dollars to bring existing LPS up to code on the ~170 ECMs here at Hill AFB. Current opinions/views of local engineers and USAF/AFCEC LPS Engineer (Ms. Campbell) is that this is a misinterpretation of the guidance and LPS is not required to protect the earth covered portions of an ECM.

Public Comment No. 74-NFPA 780-2015 [Sections 8.7.2, 8.7.3]

Sections 8.7.2, 8.7.3

8.7.2 * ~~Piers and~~ Explosives Handling Wharves.

Lightning protection systems shall be required on ~~piers and~~ explosives handling wharves where explosive materials cannot be moved to a protected area at the approach of a thunderstorm.

8.7.2.1

The portion of the ~~pier or~~ explosives habdling wharf used for explosive material staging shall be provided with a mast or catenary system unless otherwise specified by the authority having jurisdiction . .

8.7.2.2

The mast or catenary system shall be interconnected with ~~a ground loop conductor~~ a deck–level potential equalization network .

8.7.2.3

~~An additional conductor shall be installed along the pier or wharf for bonding of~~ The deck-level potential equalization network shall consist of interconnected cables and/or natural conductors running along the explosives handling wharf to provide interconnection of all permanently installed metal objects on the ~~pier~~ wharf .

8.7.2.4

~~All pier and wharf ground loop conductors shall be interconnected~~ The deck-level potential equalization network shall be provided with multiple paths to ground using main-sized conductors or equivalent spaced no greater than 100 feet average intervals .

8.7.2.5

A

~~path to earth consisting of a metal plate bonded to the additional ground loop conductor shall be permitted to create a low-resistance path by submerging in water~~

grounding electrode shall be provided for each down conductor .

8.7.

~~3 Cranes.~~

~~All cranes shall be provided with inner and outer ground loop conductors interconnected with each other.~~

~~8.7.3.1 –~~
~~The crane shall be bonded to the inner ground loop conductor~~
2.5.1 Approved grounding electrodes shall be ground rods as described in 4.13.2 or ground plate electrodes as described in 4.13.6 .

8.7.

~~3~~

2 .

~~2 –~~

~~Cranes~~
5.2 The grounding electrodes shall be

~~relocated into the lightning protection zone of protection~~
installed in the earth at the

~~approach~~
base of

~~a thunderstorm~~
the pilings .

8.7. 2.5. 3

~~.3 Boom and cable lifting shall be bonded to the outer ground loop conductor~~
Where it is not practicable to install the approved grounding electrodes in accordance with 8.7.2.5.2, it shall be permitted to create a low-resistance path by submerging the electrodes in water at a depth of no less than low tide of a 100-year drought level .

8.7.

~~3.3.1 –~~
~~Metal lifting hooks on cranes equipped with hook insulating links shall not be required to be bonded to any of the ground loop conductors~~
2.6 Cranes shall be bonded to the deck-level potential equalization network .

Statement of Problem and Substantiation for Public Comment

The Task Force on Piers and Wharves was tasked to review the changes made to clauses 8.7.2 and 8.7.3 and develop any recommended changes. It is suggested by the Task Force that “ground loop conductor” is not the best descriptor for grounding systems on piers and explosives handling wharves (EHWs) as the grounding systems may not necessarily be in the form of a loop or clearly fall within the definition of ground loop conductor. It is recommended that the original “ground ring conductor” be instead changed to the term “deck–level potential equalization network.” It is also recommended by the Task Force that since the requirements for cranes in 8.7.3 relate only to cranes on EHWs, the requirements for cranes should be limited to a requirement in 8.7.2 that they be grounded. Operational grounding requirements should be left to AHJs. Finally, editorial changes are recommended to make it clear that the requirements for piers and wharves are applicable to those used in explosives operations.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 75-NFPA 780-2015 [New Section after A.8.7.2]	
Public Comment No. 76-NFPA 780-2015 [Section No. A.8.7.2]	

Related Item

Public Input No. 258-NFPA 780-2014 [Section No. 8.7.2]
Public Input No. 259-NFPA 780-2014 [Section No. 8.7.3]
First Revision No. 37-NFPA 780-2014 [Section No. 8.7.2]
First Revision No. 38-NFPA 780-2014 [Section No. 8.7.3]

Submitter Information Verification

Submitter Full Name:	MITCHELL GUTHRIE
Organization:	ENGINEERING CONSULTANT
Affilliation:	Submitted on behalf of the Piers and Wharfs Task Force of the Explosives Task Group
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Wed May 13 16:31:09 EDT 2015

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	SR-21-NFPA 780-2015
Statement:	The Technical Committee provides clarification of the application of the ground loop concept by using the term “deck–level potential equalization network” for the wharf. The Technical Committee changes the title of the subsection and edits the text to clarify the application to Wharves and Piers for Explosives Operations, adds 100 ft (30 m) average intervals for consistency with Chapter 4, simplifies bonding for cranes, and provides specific guidance for submerging grounding electrodes. The Technical Committee consolidates 8.7.2 and 8.7.3 under Wharves and Piers for Explosives Operations. The Technical Committee provides annex text for additional guidance.

Public Comment No. 88-NFPA 780-2015 [Section No. 8.7.2.5]

8.7.2.5

A path to earth consisting of a metal plate bonded to the additional ground loop conductor shall be permitted to create a low-resistance path by submerging ~~in~~ the loop in water.

Statement of Problem and Substantiation for Public Comment

Text changed by the editorial TC to add clarity as to what was being submerged

Related Item

First Revision No. 37-NFPA 780-2014 [Section No. 8.7.2]

Submitter Information Verification

Submitter Full Name: STEPHEN HUMENIUK
Organization: WARREN LIGHTNING ROD COMPANY
Affilliation: ULPA
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 09:10:38 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-21-NFPA 780-2015

Statement: The Technical Committee provides clarification of the application of the ground loop concept by using the term “deck–level potential equalization network” for the wharf.

The Technical Committee changes the title of the subsection and edits the text to clarify the application to Wharves and Piers for Explosives Operations, adds 100 ft (30 m) average intervals for consistency with Chapter 4, simplifies bonding for cranes, and provides specific guidance for submerging grounding electrodes.

The Technical Committee consolidates 8.7.2 and 8.7.3 under Wharves and Piers for Explosives Operations.

The Technical Committee provides annex text for additional guidance.

Public Comment No. 89-NFPA 780-2015 [Section No. 8.7.3.3 [Excluding any Sub-Sections]]

Boom and cable lifting ?????? shall be bonded to the outer ground loop conductor.

Statement of Problem and Substantiation for Public Comment

Text as written does not make sense

Related Item

Public Input No. 259-NFPA 780-2014 [Section No. 8.7.3]

Submitter Information Verification

Submitter Full Name: STEPHEN HUMENIUK
Organization: WARREN LIGHTNING ROD COMPANY
Affilliation: ULPA
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 09:14:22 EDT 2015

Committee Statement

Committee Action: Unknown Reason
Resolution: The submitter has not provided text for consideration as required by the Regulations Governing The Development of NFPA Standards, 4.4.4.3(c).

Public Comment No. 90-NFPA 780-2015 [Section No. 8.7.3.3.1]

8.7.3. ~~3.1~~ 4
Metal lifting hooks on cranes equipped with hook insulating links shall not be required to be bonded to any of the ground loop conductors.

Statement of Problem and Substantiation for Public Comment

Editorial change made to comply with MOS section 1.8.1.

Related Item

First Revision No. 38-NFPA 780-2014 [Section No. 8.7.3]

Submitter Information Verification

Submitter Full Name: STEPHEN HUMENIUK
Organization: WARREN LIGHTNING ROD COMPANY
Affilliation: ULPA
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 09:21:51 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-21-NFPA 780-2015

Statement: The Technical Committee provides clarification of the application of the ground loop concept by using the term “deck–level potential equalization network” for the wharf.

The Technical Committee changes the title of the subsection and edits the text to clarify the application to Wharves and Piers for Explosives Operations, adds 100 ft (30 m) average intervals for consistency with Chapter 4, simplifies bonding for cranes, and provides specific guidance for submerging grounding electrodes.

The Technical Committee consolidates 8.7.2 and 8.7.3 under Wharves and Piers for Explosives Operations.

The Technical Committee provides annex text for additional guidance.

Public Comment No. 33-NFPA 780-2015 [Section No. 8.7.5.4.5]

~~8.7.5.4.5~~

~~All ground connections shall provide impedance to earth that is as low as practicable.~~

Statement of Problem and Substantiation for Public Comment

I do not believe this language is enforceable as a requirement.

Related Item

First Revision No. 41-NFPA 780-2014 [Section No. 8.7.5.4.5]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 12:59:31 EDT 2015

Committee Statement

Committee Action: Unknown Reason
Resolution: The Technical Committee chooses to retain the text. The intent is to achieve the lowest possible practicable impedance.

Public Comment No. 78-NFPA 780-2015 [Section No. 8.10.6.3]

8.10.6.3

SPDs shall be inspected in accordance with the manufacturer's instructions at intervals not exceeding 7 months or when visual inspection is ~~performed~~ performed and after any suspected lightning strike .

Statement of Problem and Substantiation for Public Comment

The additional text is relocated from 8.10.7.7 as it deals with SPD verification. The inspection cycle is maintained to be 7 months as justified by supporting material associated with PC-77.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 77-NFPA 780-2015 [Section No. 8.10.7.7]	original location of added text with substantiation

Related Item

Public Input No. 201-NFPA 780-2014 [Section No. 8.10.7.7]

First Revision No. 43-NFPA 780-2014 [Section No. 8.10.7.7]

Submitter Information Verification

Submitter Full Name: MITCHELL GUTHRIE
Organization: ENGINEERING CONSULTANT
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City:
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Zip:
Submittal Date: Thu May 14 00:24:13 EDT 2015

Committee Statement

Committee Action: Accepted
Resolution: SR-22-NFPA 780-2015
Statement: The Technical Committee provides requirements to assure continued operation after a suspected lightning strike.

Public Comment No. 77-NFPA 780-2015 [Section No. 8.10.7.7]

~~8.10.7.7~~ * - –

~~Unless monitored remotely through a continuous monitoring system, SPDs shall be verified as operable monthly, or after any suspected lightning strike.~~

Statement of Problem and Substantiation for Public Comment

Delete 8.10.7.7 and its associated annex material to remove the conflicting requirements with 8.10.6.3. One of these clauses should be deleted and it logically should be 8.10.7.7 because 8.10.7 deals with electrical testing of lightning protection systems, not visual inspections of SPD systems. However, the requirement that a visual inspection be conducted after a suspected lightning strike should be maintained by incorporation into 8.10.6.3. Additionally, there is no technical justification for such a radical reduction in inspection frequency if an inspection is required after it is expected that there has been a direct or nearby strike to the structure.
Supporting material addressing the justification for maintaining the 7 month inspection frequency is provided.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 78-NFPA 780-2015 [Section No. 8.10.6.3]	
Public Comment No. 79-NFPA 780-2015 [Section No. A.8.10.7.7]	

Related Item
Public Input No. 201-NFPA 780-2014 [Section No. 8.10.7.7]
First Revision No. 43-NFPA 780-2014 [Section No. 8.10.7.7]

Submitter Information Verification

Submitter Full Name: MITCHELL GUTHRIE
Organization: ENGINEERING CONSULTANT
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Zip:
Submittal Date: Wed May 13 23:47:11 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-25-NFPA 780-2015
Statement: The Technical Committee deletes the text because it is redundant as it conflicts with the requirements with 8.10.6.3. The annex text is also deleted.

Public Comment No. 81-NFPA 780-2015 [Section No. 9.2.3]

9.2.3

~~Air terminations, down conductors, and bonding~~ Lightning protection components for the protection of meteorological instruments and aircraft warning lights located on the nacelle shall be provided in accordance with Chapter 4.

Statement of Problem and Substantiation for Public Comment

Editorial. New term refers to the intended items more clearly.

Related Item

First Revision No. 26-NFPA 780-2014 [Section No. 9.2]

Submitter Information Verification

Submitter Full Name: MATTHEW CAIE
Organization: ERICO INC
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 03:02:12 EDT 2015

Committee Statement

Committee Action: Accepted
Resolution: SR-39-NFPA 780-2015
Statement: The Technical Committee edits the text for clarity.

Public Comment No. 82-NFPA 780-2015 [Section No. 9.2.5]

9.2.5

The cover for the hub, referred to as the spinner, shall be protected with a strike termination device as required in Section 4.6 if its metallic outer thickness is less than 4 . 8mm (3/16 in.)

Statement of Problem and Substantiation for Public Comment

Clarification that additional strike termination device are not required if the spinner meets the minimum metallic thickness requirements.

Related Item

First Revision No. 26-NFPA 780-2014 [Section No. 9.2]

Submitter Information Verification

Submitter Full Name: MATTHEW CAIE
Organization: ERICO INC
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 03:04:40 EDT 2015

Committee Statement

Committee Action: Rejected
Resolution: The submitter introduces new material that has not had public review.

Public Comment No. 83-NFPA 780-2015 [Section No. 12.2.2]

12.2.2

Protection shall be provided by either of the following methods:

(1) Direct mounting of strike termination devices to the solar array rack as shown in Figure 12.2.2(a) [*the rack looks to have an optical illusion, is it possible to raise the rack higher up the Solar Panel support poles to look more realistic. Also the bonding of the support poles to the ground loop needs to be illustrated more clearly* .]

(2) Locating strike termination devices (including air terminals, masts, and overhead ground wires) adjacent to the solar panels in such a manner as to place the solar panels in a zone of protection as defined in Section 4.8 and shown in Figure 12.2.2(b). [*add an annotation to Figure 12.2.2b to indicate that the grounding of the solar panel (all exposed metal parts) is also required under NEC690*]

Figure 12.2.2(a) Typical Protection Arrangement with Air Terminals Mounted from Rack.

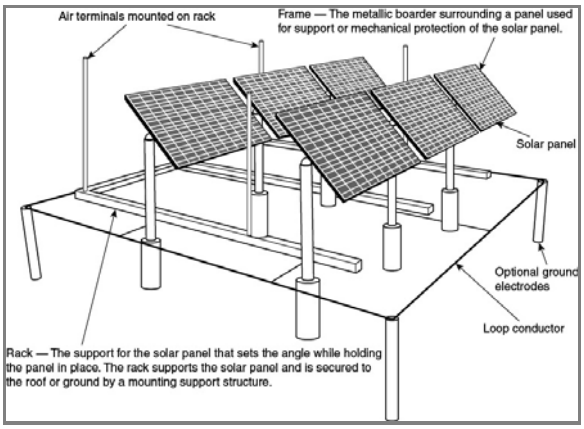
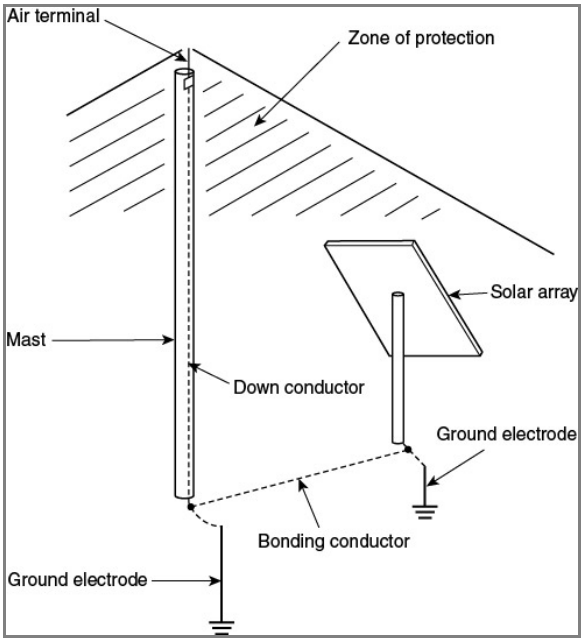


Figure 12.2.2(b) Typical Adjacent Mast Arrangement to Provide Zone of Protection for Solar Array.



Statement of Problem and Substantiation for Public Comment

Additional annotation to the figure to note that this is also an NEC 690 requirement. Also a request to improve the figure to show the rack location higher to just beneath the modules and for the bonding to the ground loop be

emphasized for clarification.

Related Item

First Revision No. 120-NFPA 780-2014 [Chapter 12]

Submitter Information Verification

Submitter Full Name: MATTHEW CAIE
Organization: ERICO INC
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 03:10:32 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-36-NFPA 780-2015
Statement: The Technical Committee updates the figures and corrects a typo. The Technical Committee adds a note to Figure 12.2.2(b) to reference NEC 690.

Public Comment No. 84-NFPA 780-2015 [Section No. 12.4.2.3]

12.4.2.3

PV surge protective devices shall be listed for use on PV systems and marked ~~"DC" or~~ "PV SPD."

Statement of Problem and Substantiation for Public Comment

Propose to remove the reference to DC as the UL1449 standard refers to PV SPD. DC type SPDs are no longer allowed but may be grandfathered.

Related Item

First Revision No. 120-NFPA 780-2014 [Chapter 12]

Submitter Information Verification

Submitter Full Name: MATTHEW CAIE
Organization: ERICO INC
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 03:23:02 EDT 2015

Committee Statement

Committee Action: Rejected

Resolution: The Technical Committee does not recommend to change the text. The Technical Committee keeps the term "DC" to ensure there is adequate time for the UL1449 edition to be a requirement in 2017. "DC" can be dropped during the next cycle

Public Comment No. 63-NFPA 780-2015 [Section No. A.3.3.23]

A.3.3.23 Light Base.

The light base is cylindrically shaped with a closed bottom and a top flange to mate with an airfield fixture or cover. The light base has provisions for cable or conduit entry and exit and provisions for bonding.

Type L-867 light bases and extensions are used for applications subject to occasional light vehicular loading but no aircraft or other heavy vehicular loading. Type L-868 light bases and extensions are used for applications subject to aircraft and other heavy vehicular loading. Light bases, which can be fabricated from metallic or nonmetallic materials, serve as a connection point for the raceway and housing for mounting the light fixture. Light bases are subject to direct earth burial with or without concrete backfill. Drain connections, load rings, and other options are available for the light base.

Additional information can be found in FAA Advisory Circular 150/5345-~~42F~~ 42G , *Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories*.

Statement of Problem and Substantiation for Public Comment

PI-129 initiated editorial changes to the Light Base definition which resulted in FR-1. The editorial task group discovered an ambiguity in the proposed new definition. This Public Comment is to correct that ambiguity. The Editorial Task Group noted that part of the original definition included explanatory material. This Public Comment moves the explanatory material to Annex A.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 62-NFPA 780-2015 [Section No. 3.3.23]	Definition for supporting Annex A material.

Related Item

Public Input No. 129-NFPA 780-2014 [Section No. 3.3.22]

First Revision No. 1-NFPA 780-2014 [Section No. 3.3.22]

Submitter Information Verification

Submitter Full Name: CARL JOHNSON II
Organization: AVCON INC
Affilliation: none
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City:
State:
Zip:
Submittal Date: Sat May 09 11:31:34 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-4-NFPA 780-2015

Statement: The Technical Committee revises the light base Annex A text to include explanatory text originally in the definition in Chapter 3.

The Technical Committee edits the light base as units offered today have provisions for

bonding.

The Technical Committee does not update the FAA Advisory Circular references as it was not considered in the FR.

Public Comment No. 19-NFPA 780-2015 [Section No. A.3.3.25]

A.3.3.25 Lightning Protection System.

The term refers to systems as described and detailed in this standard. A traditional lightning protection system used for aboveground structures is described in Chapter 4. Lightning protection systems for underground airfield lighting circuits are described in Chapter 11.

Statement of Problem and Substantiation for Public Comment

PI-75 provides as a Statement of Problem and Substantiation for Public Input - “As far as I know there are not any underground lightning protection systems. Word differently.”

During the task group’s deliberation on PI-75 the task group decided that a clarification of the definition of a lightning protection system was necessary.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 17-NFPA 780-2015 [Section No. 3.3.25]	partial public comment to PI-75, LPS definition
Public Comment No. 18-NFPA 780-2015 [New Section after 3.3.25]	partial public comment to PI-75, LPS definition

Related Item

Public Input No. 75-NFPA 780-2014 [Section No. 11.1.2]

Submitter Information Verification

Submitter Full Name: Carl Johnson II
Organization: AVCON, Inc.
Affilliation: none
Street Address:
City:
State:
Zip:
Submittal Date: Sat Mar 28 13:56:01 EDT 2015

Committee Statement

Committee Action: Unknown Reason

Resolution: The Technical Committee does not see the submitter’s definition revision as necessary. The definition is succinct as used in the document.

Public Comment No. 94-NFPA 780-2015 [New Section after A.3.3.33]

A.3.3.37 Solar Panel.

Collectors collect heat by absorbing sunlight and are used in water heater systems, parabolic troughs, parabolic-dishes, evacuated-tubes, solar air heaters or solar tower systems. Modules convert solar radiation into direct current (dc) electricity.

Statement of Problem and Substantiation for Public Comment

Editorial change to move explanatory information.

Related Item

First Revision No. 103-NFPA 780-2014 [New Section after 3.3.32]

Submitter Information Verification

Submitter Full Name: STEPHEN HUMENIUK
Organization: WARREN LIGHTNING ROD COMPANY
Affilliation: ULPA
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 15 09:56:16 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-37-NFPA 780-2015
Statement: The Technical Committee revises the definition. The last two sentences are relocated to the Annex.

Public Comment No. 95-NFPA 780-2015 [New Section after A.7.4.1.2]

Add following annex text to supplement proposed new 7.4.2.2

A.7.4.2.2 Guthrie and Rousseau, in "*Lightning Related Ignition Mechanism an Associated Protection Techniques for Storage Applications*" presented at the 9th Global Conference on Process Safety, discusses hot spot temperatures resulting from lightning strikes and gives measured values of temperatures on the interior of metal plates of various sizes and materials. References where additional information can be obtained are also provided in the paper.

Additional Proposed Changes

File Name	Description	Approved
GCPS_2013_Final_Paper_-_Presented.pdf	Copy of referenced paper.	

Statement of Problem and Substantiation for Public Comment

The proposed new 7.4.2.2 indicates consideration be given to the temperature rise of the internal surface of lightning attachment points and the ignition temperature of the contents of the tank when determining to waive lightning protection requirements. The annex material submitted in this comment provides additional information on how hot spots can contribute to ignition of contents relevant to making these determinations..

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 53-NFPA 780-2015 [New Section after 7.4.2.2]	supplementing annex material
Public Comment No. 97-NFPA 780-2015 [Section No. O.1.2.8]	

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

Submitter Full Name: MITCHELL GUTHRIE
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City:
State:
Zip:
Submittal Date: Fri May 15 14:04:58 EDT 2015

Committee Statement

Committee Action: Rejected
Resolution: The submitter introduces new material that has not had the opportunity for public review.

Public Comment No. 75-NFPA 780-2015 [New Section after A.8.7.2]

TITLE OF NEW CONTENT

Type your content here ...

A.8.7.2.4 The conductors between the deck-level potential equalization network and grounding electrodes should be provided at or near the location of lightning protection masts or catenary cables where practicable.

Statement of Problem and Substantiation for Public Comment

The proposed revision is necessary to provide the recommended interconnections between the deck-level potential equalization network proposed in Public Comment 74, the associated grounding electrodes, and lightning protection systems installed on the structure.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 74-NFPA 780-2015 [Sections 8.7.2, 8.7.3]	Supporting explanatory material

Related Item

Public Input No. 258-NFPA 780-2014 [Section No. 8.7.2]

First Revision No. 37-NFPA 780-2014 [Section No. 8.7.2]

Submitter Information Verification

Submitter Full Name:	MITCHELL GUTHRIE
Organization:	ENGINEERING CONSULTANT
Affilliation:	Submitted on behalf of the Piers and Wharves Task Force of the Explosives Task Group
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Wed May 13 17:10:20 EDT 2015

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	SR-23-NFPA 780-2015
Statement:	The Technical Committee adds annex text to clarify the conductor placement for a deck-level potential equalization network.

Public Comment No. 76-NFPA 780-2015 [Section No. A.8.7.2]

A.8.7.2

The purpose of the lightning protection system ~~on the piers or wharves is~~ requirements expressed in this paragraph is to protect the explosives positioned on these structures from being ignited by direct lightning strikes. ~~A ship alongside a pier or wharf~~ Open air explosives staging areas on a wharf will generally require lightning protection from a mast or catenary system. A ship alongside an explosives handling wharf is capable of providing a zone of protection for a section of the ~~pier or wharf. The portion of the pier or wharf used for explosives staging will require lightning protection from a mast or catenary system~~ explosives handling wharf and may be considered for providing the protection for an explosives staging area .

Statement of Problem and Substantiation for Public Comment

The proposed revision is required to be consistent with the proposed revisions made in Public Comment 74. An additional editorial change was made to better link the purpose of the supplemented requirement and clarify that the existing last sentence is not intended to be mandatory text.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 74-NFPA 780-2015 [Sections 8.7.2, 8.7.3]	Syncronization of terminology

Related Item

Public Input No. 258-NFPA 780-2014 [Section No. 8.7.2]

First Revision No. 37-NFPA 780-2014 [Section No. 8.7.2]

Submitter Information Verification

Submitter Full Name:	MITCHELL GUTHRIE
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Street Address:	
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Submittal Date:	Wed May 13 17:32:52 EDT 2015

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	SR-24-NFPA 780-2015
Statement:	The Technical Committee edits the text to provide clarity and to comply with the MOS.

Public Comment No. 79-NFPA 780-2015 [Section No. A.8.10.7.7]

~~A.8.10.7.7 —~~
~~For methods to verify the operation of the SPD, see NFPA 70B.~~

Statement of Problem and Substantiation for Public Comment

PC-77 deletes 8.10.7.7 which requires removal of the supporting annex text.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 77-NFPA 780-2015 [Section No. 8.10.7.7]	Deletes 8.10.7.7

Related Item

Public Input No. 201-NFPA 780-2014 [Section No. 8.10.7.7]
First Revision No. 43-NFPA 780-2014 [Section No. 8.10.7.7]

Submitter Information Verification

Submitter Full Name: MITCHELL GUTHRIE
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City:
State:
Zip:
Submittal Date: Thu May 14 00:38:41 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-25-NFPA 780-2015
Statement: The Technical Committee deletes the text because it is redundant as it conflicts with the requirements with 8.10.6.3. The annex text is also deleted.

Public Comment No. 20-NFPA 780-2015 [Section No. A.11.2.1]

A.11.2.1

A typical airfield lighting series (current-driven) circuit is powered by a constant current regulator (CCR) or equivalent power supply. Current is the same at all points in the series circuit. The output voltage is directly proportional to the load and output current step. The CCR output (primary circuit) is normally ungrounded. The internal overcurrent protection of the CCR or an equivalent power supply monitors the actual output current. Series airfield lighting circuit overcurrent protection does not rely on a low impedance return path or ground connection for proper operation.

The installation of an equipotential airfield lighting counterpoise system on a series circuit also provides equipotential bonding between all elements of the airfield lighting system. The airfield lighting counterpoise system maintains all interconnected components at earth potential and protects personnel from possible contact with energized metallic light bases, mounting stakes, or fixtures.

~~Lightning strikes often occur on the pavement, and the counterpoise conductor provides a method of dissipating the energy as it moves from the pavement surface to the earth.~~

Statement of Problem and Substantiation for Public Comment

The sentence was moved from A.11.2.1 and placed at the end of A.11.4.2.6.2 during the resolution of PI No. 78 by FR-6. The text was not deleted in A.11.2.1.

Related Item

Public Input No. 78-NFPA 780-2014 [Section No. A.11.2.1]

First Revision No. 6-NFPA 780-2014 [Section No. 11.4]

Submitter Information Verification

Submitter Full Name: Carl Johnson II
Organization: AVCON, Inc.
Affilliation: none
Street Address:
City:
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Submittal Date: Sat Apr 18 12:48:08 EDT 2015

Committee Statement

Committee Action: Accepted
Resolution: SR-5-NFPA 780-2015
Statement: The Technical Committee deletes the last paragraph since the paragraph is duplicated in A.11.4.2.6.2.

Public Comment No. 21-NFPA 780-2015 [Section No. A.11.4.2.4]

A.11.4.2.4

A Chapter 4–compliant lightning protection system and SPDs could be installed at the airfield lighting vault or other airfield lighting circuit power source.

The need for an airfield lighting vault building lightning protection system, SPDs, or surge arresters should be determined by the Engineer of Record, based on sound engineering practices. Lightning protection systems, SPDs, and surge arresters are recommended for high-priority airfield lighting systems and airfield lighting systems installed in areas with a lightning flash density greater than two flashes per square kilometer per year.

The criteria in A.11.4.1.1 can be used to determine if the airfield lighting field circuits should be provided with surge arresters.

A lightning risk assessment performed in accordance with Annex L can be used to determine if the airfield lighting vault building or equivalent electrical equipment protective structure should be provided with a lightning protection system and SPDs in accordance with Chapter 4.

The AHJ can determine and approve the need for the airfield lighting vault building or equivalent electrical equipment protective structure lightning protection system, SPDs, and airfield lighting circuit surge arresters.

Statement of Problem and Substantiation for Public Comment

Completes the renumbering of references necessary in support of FR-6.

Related Item

First Revision No. 6-NFPA 780-2014 [Section No. 11.4]

Submitter Information Verification

Submitter Full Name: Carl Johnson II
Organization: AVCON, Inc.
Affilliation: none
Street Address:
City:
State:
Zip:
Submittal Date: Sat Apr 18 13:12:43 EDT 2015

Committee Statement

Committee Action: Accepted
Resolution: SR-6-NFPA 780-2015
Statement: The Technical Committee changes reference A.11.4.1 to the correct reference of A.11.4.1.1.

Public Comment No. 22-NFPA 780-2015 [Section No. A.11.4.2.6.1.2]

A.11.4.2.6.1.2

Airfield pavement systems design is an intricate engineering solution involving a large number of complex variables. Operating aircraft and pavement systems interact with each other, which must be addressed by the pavement design process. Structural designs of airfield pavement systems include determination of the overall pavement system thickness to achieve the final design objectives. Airfield pavement systems are normally constructed in courses or layers.

Many factors influence the pavement system layer thicknesses required to provide satisfactory pavement system design. Among them are the type of pavement and the load-bearing capacity of the supporting materials, key components that affect the structural design of the pavement system.

A typical pavement system design might consist of the following layers:

(1) Conditioned and compacted earth fill and subgrade below the pavement system (typically 100 percent compaction required)

(2) Enhanced subbase course material, including additional layering, or enhanced existing subgrade

(3) Pavement base course (flexible or semirigid materials to support the pavement surface materials)

(4) Final pavement surface, either hot mix asphalt (HMA), a flexible pavement typically installed in multiple layers, or Portland cement concrete (PCC), a rigid pavement typically installed in one layer

The thickness of each of the overall pavement layers is determined by the structural requirements of the pavement system based on existing conditions, aircraft sizes and weights, number of repetitions, environmental factors, and other features.

The airfield lighting system is incorporated into the airfield pavement system. The design of the depth and the height of the various airfield lighting system components, including light bases, light base accessories, conduits, counterpoise conductors, and the like, must be adjusted to integrate the components into the varying pavement system layer thicknesses. Although reasonable effort should be made to comply with the 8 in. (200 mm) requirement contained in 11.4.2.6.1.1, it is for these reasons that the variation described in 11.4.2.6.1.2 is necessary.

Statement of Problem and Substantiation for Public Comment

".....Airfield pavement systems are normally constructed in courses or layers.

Many factors influence the pavement system layer thicknesses required to provide satisfactory pavement system design....."

The hard return between the two paragraphs was omitted in the on-line version. The two paragraphs are properly shown in Fr-6

Related Item

First Revision No. 6-NFPA 780-2014 [Section No. 11.4]

Submitter Information Verification

Submitter Full Name: Carl Johnson II
Organization: AVCON, Inc.
Affilliation: none
Street Address:
City:
State:
Zip:

Submittal Date: Sat Apr 18 18:06:40 EDT 2015

Committee Statement

Committee Action: Accepted

Resolution: SR-7-NFPA 780-2015

Statement: ".....Airfield pavement systems are normally constructed in courses or layers.

Many factors influence the pavement system layer thicknesses required to provide satisfactory pavement system design....."

The Technical Committee separates the single first paragraph into two paragraphs.

Public Comment No. 34-NFPA 780-2015 [Section No. K.3]

K.3 Current Sharing Considerations.

Annex G of IEC 62305-4, Protection Against Lightning — Part 4: Electrical and Electronic Systems Within Structures, provides information concerning the current sharing that is likely between the lightning protection conductors and the PV output circuit cabling, during a lightning event. For this analysis, it considers the following two cases:

(1) Where the separation distance(s) cannot be maintained between the lightning protection system and the photovoltaic modules, and thus equipotential bonding must be applied,

(2) Where the separation distance(s) can be maintained and no bonding between the lightning protection system and the photovoltaic system is required.

Depending on each case, the current sharing of the lightning current to ground is divided between the lightning protection system and the PV output circuit cabling. This in turn affects the selection (class and ratings) of SPDs that will be installed on the photovoltaic system. For example, if the separation distance between the strike termination devices and the photovoltaic modules cannot be maintained for the ~~specific lightning protection level (LPL) being~~ calculated bonding distance being designed to, then the strike termination devices must be bonded to the photovoltaic module supporting rack. This then implies that the PV output circuit, will also act to carry a portion of the lightning current to ground. In its simplest form, the current sharing can be considered as:

$$I = I_{pk} / n \qquad \textbf{[K.3]}$$

where:

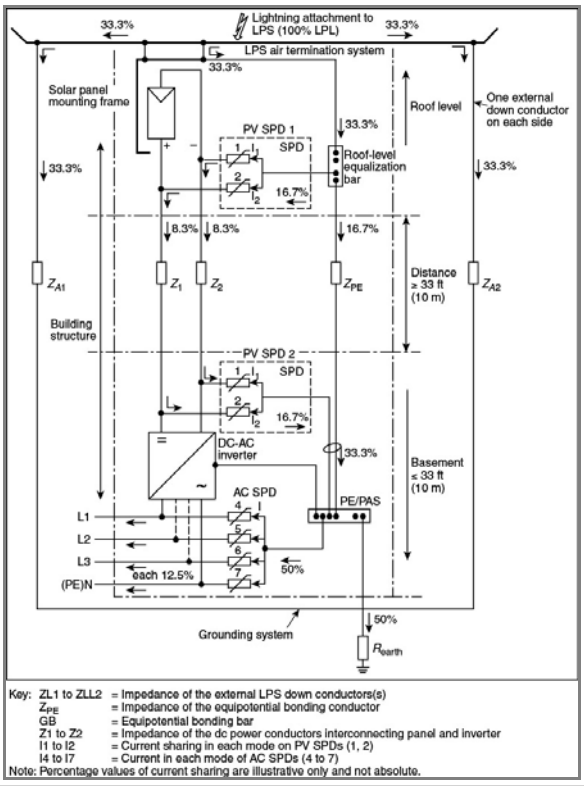
I_{pk} = is the peak lightning discharge current

n = is the number of parallel paths to ground

In this example where bonding is required, n is taken to be equal to the number of down conductors (1), because the PV output circuit is also considered a path to ground. This is a simplistic model but does serve to illustrate that the photovoltaic system can become involved in the conveyance of lightning current to ground. This implication then also follows through to the selection of the surge protective devices (SPDs) that will be installed on the PV output circuit. In the preceding example, where the strike termination devices are bonded to the module racks, the PV output circuit will also convey a portion of the lightning current to ground.

Figure K.3 depicts a current sharing concept between the lightning protection and photovoltaic systems and how this impacts on the various SPDs installed.

Figure K.3 Depiction of a Roof Level PV Installation Showing Typical Lightning Current Distribution Among Current Carrying Conductors and SPDs. ***(Source: modified from IEC 62305-4, Protection Against Lightning — Part 4: Electrical and Electronic Systems Within Structures, edition 3.)***



Statement of Problem and Substantiation for Public Comment

The phrase "calculated bonding distance" carries more meaning to the 780 user than the currently referenced "specific lightning protection level (LPL)".

Related Item

First Revision No. 121-NFPA 780-2014 [New Section after O.3]

Submitter Information Verification

Submitter Full Name: HAROLD VANSICKLE
Organization: LIGHTNING PROTECTION INSTITUTE
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 30 14:18:39 EDT 2015

Committee Statement

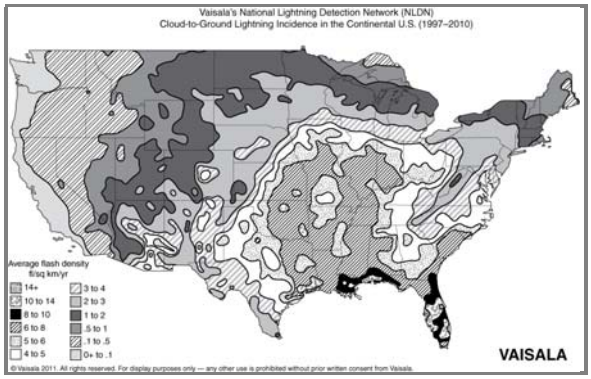
Committee Action: Accepted
Resolution: SR-38-NFPA 780-2015
Statement: The Technical Committee edits the second paragraph because it adds clarify by using terms that are familiar to NPFA 780.

Public Comment No. 72-NFPA 780-2015 [Section No. L.2]

L.2 Lightning Flash Density (N_G).

Lightning flash density, the yearly number of flashes to ground per square kilometer, can be found in Figure L.2.

Figure L.2 1997–2014 Average U.S. Lightning Flash Density Map (Flashes per Square Kilometer per Year). *(Courtesy Vaisala, Inc.)*



Additional Proposed Changes

File Name	Description	Approved
avg_fd_2005-2014_CONUS_2km_grid.png	2005-2014 Flash Density Map	

Statement of Problem and Substantiation for Public Comment

The map submitted during the First Draft Proposal was not the updated map. This is corrected by replacement with the attached map.

Related Item

Public Input No. 244-NFPA 780-2014 [Section No. L.2]

Submitter Information Verification

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Affilliation:	This submission is made on behalf of the Risk Assessment Task Group
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Submittal Date:	Wed May 13 07:47:12 EDT 2015

Committee Statement

Committee Action:	Rejected but see related SR

Resolution: SR-9-NFPA 780-2015

Statement: The Technical Committee provides a new map that provides updated flash densities. The grey-scale map is required for publication in the standard but could be difficult to accurately resolve so Vaisala, Inc. will be hosting an interactive color version on their web site. A URL for the location of the original map is provided to enable the user to use this resource.

Public Comment No. 61-NFPA 780-2015 [Section No. L.6.6.1.2]

L.6.6.1.2

The annual threat of occurrence due to strikes near a structure (N_M) is given by the following equation *(see Figure L.6.6.1.2)*:

$$N_M = N_G (A_M - A_D)(C_D)10^{-6} \text{events/year} \quad \textbf{[L.6.6.1.2]}$$

where:

N_G = lightning ground flash density in flashes/km^2/year *(see Section L.2)*

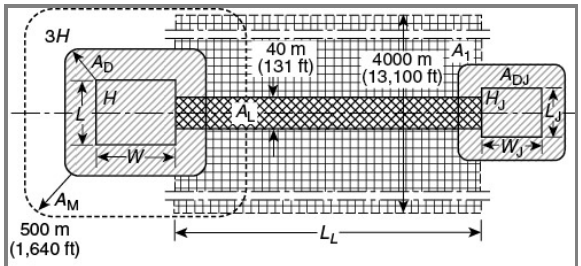
A_M = collection area of flashes near the structure (m^2) *(see Figure L.6.6.1.2)*

A_D = equivalent collection area of the structure (m^2) *(see Figure L.6.6.1.2)*

C_D = environmental coefficient *(see Table L.4.2)*

The collection area (A_M) for flashes near the structure includes the area extending a distance of 500 m (1640 ft) around the perimeter of the structure. For cases where N_M is negative, a value of 0 is assigned to N_M .

Figure L.6.6.1.2 Collection Areas (A_D, A_M, A_L, A_{DJ}, A_I). (Source: IEC.)



Notes:
1. Area A_D is the area subject to direct strikes to the facility *(see L.6.6.1.1)*.
2. Area A_M is the area subject to strikes near the structure *(see L.6.6.1.2)*.
3. Area A_L is the area subject to direct strikes to the incoming service *(see L.6.6.1.3)*.
4. Area D_I is the area subject to strikes to the adjacent structure *(see L.6.6.1.4)*.
5. Area A_I is the area subject to strikes near the incoming service *(see L.6.6.1.5)*.

Additional Proposed Changes

File Name	Description	Approved
Figure_L.6.6.1.2.docx		

Statement of Problem and Substantiation for Public Comment

Two typos were identified in the Figure L.6.6.1.2 from the figure from the public input. This comment corrects the typos.

Related Item

First Revision No. 137-NFPA 780-2014 [Sections L.6.6.1.2, L.6.6.1.3]

Submitter Information Verification

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Zip:

Submittal Date: Fri May 08 13:12:06 EDT 2015

Committee Statement

Committee Action: Accepted

Resolution: SR-10-NFPA 780-2015

Statement: The Technical Committee corrects the text in the figure to provide the proper subscripts.

Public Comment No. 67-NFPA 780-2015 [Section No. L.6.6.1.3]

L.6.6.1.3

The annual threat of occurrence due to a strike to an incoming service (N_L) is characterized by the following formula:

$$N_L = N_G A_I C_D C_T 10^{-6} \text{events/year} \qquad \text{[L.6.6.1.3]}$$

where:

N_G = lightning ground flash density in flashes/km^2/year *(see Section L.2)*

A_I = collection area of flashes striking the service (m^2) *(see Figure L.6.6.1.2)*

C_D = *environmental coefficient of the incoming service (same as for structures per Table L.4.2)*

C_T = correction factor for the presence of an HV/LV transformer located between the point of strike and the structure

Where the value of L_G (used in the determination of A_I) is not known, a value of 1 km is assumed for the assessment. A default value of 500 Ωm can be used for soil resistivity (ρ) where this value cannot be determined.

If the installation incorporates underground cables run underneath a ground mesh, A_I could be assumed to be 0 for that cable set (N_L = 0).

C_T applies to line sections between the transformer and the structure. A value of 0.2 is applicable for installations having a transformer located between the strike and the structure. Otherwise, a value of 1 is assigned to this variable.

Where

_____ A_L = 40 x L_L

_____ L_L = the length of the incoming service (See Figure L.6.6.1.2)

ALSO REPLACE A_I IN FORMULA L.6.6.1.3 WITH A_L

Statement of Problem and Substantiation for Public Comment

The correct factor in this formula is AL not AI and needs too be replaced in all locations. The definition and formula for LL was left out in the final FIRST DRAFT and is being added.

Related Item

First Revision No. 137-NFPA 780-2014 [Sections L.6.6.1.2, L.6.6.1.3]

Submitter Information Verification

Submitter Full Name: DAVID MCAFEE
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Submittal Date: Sat May 09 12:48:33 EDT 2015

Committee Statement

Committee Action: Accepted

Resolution:	SR-11-NFPA 780-2015
Statement:	The Technical Committee corrects the text to provide the proper subscripts.

Public Comment No. 68-NFPA 780-2015 [Section No. L.6.6.3.1]

L.6.6.3.1 Injury to Humans.

The following equation calculates the value of injury to humans:

$$L_A = L_U = r_T \times L_T \quad \text{[L.6.6.3.1]}$$

where:

L_A = ~~value for loss of human life~~

L_U = value of ~~loss of living~~ injury to a Human or living being

r_T = reduction factor for type of surface soil or floor *(see Table L.6.7.10)*

L_T = mean value of loss of life *(see Table L.6.7.9)*

ALSO DELETE "L_A =" from formula L.6.6.3.1

Statement of Problem and Substantiation for Public Comment

The factor L SUB A is for loss of life and the factor L SUB U is for injury to living beings. These changes clarify the difference in the two factors.

Related Item

First Revision No. 140-NFPA 780-2014 [Section No. L.6.6.3]

Submitter Information Verification

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Submittal Date: Sat May 09 13:00:27 EDT 2015

Committee Statement

Committee Action: Unknown Reason

Resolution: By changing the definition of LU the submitter introduces new material that has not had the opportunity of public review.

Public Comment No. 69-NFPA 780-2015 [Section No. L.6.7.1]

L.6.7.1

Table L.6.7.1 provides values for the service environmental coefficient ($C_{~~E~~ D}$).

Table L.6.7.1 Service Environmental Coefficient, $C_{~~E~~ D}$

Service Environment	$C_{~~E~~ D}$
Urban with buildings exceeding 20 m high	0.01
Urban — population greater than 50,000	0.1
Suburban — residential on outskirts of cities	0.5
Rural — settled areas outside of towns and cities	1

Statement of Problem and Substantiation for Public Comment

A typo from the FR submittal changed the Environmental Coefficient to C SUB E when the correct factor should be C SUB D. This submittal makes the change back to C SUB D.

Related Item

First Revision No. 141-NFPA 780-2014 [Sections L.6.7.1, L.6.7.2, L.6.7.3]

Submitter Information Verification

Submitter Full Name: DAVID MCAFEE
Organization: LIGHTNING FIRE PROTECTION CO
Street Address:
City:
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Submittal Date: Sat May 09 13:06:09 EDT 2015

Committee Statement

Committee Action: Unknown Reason

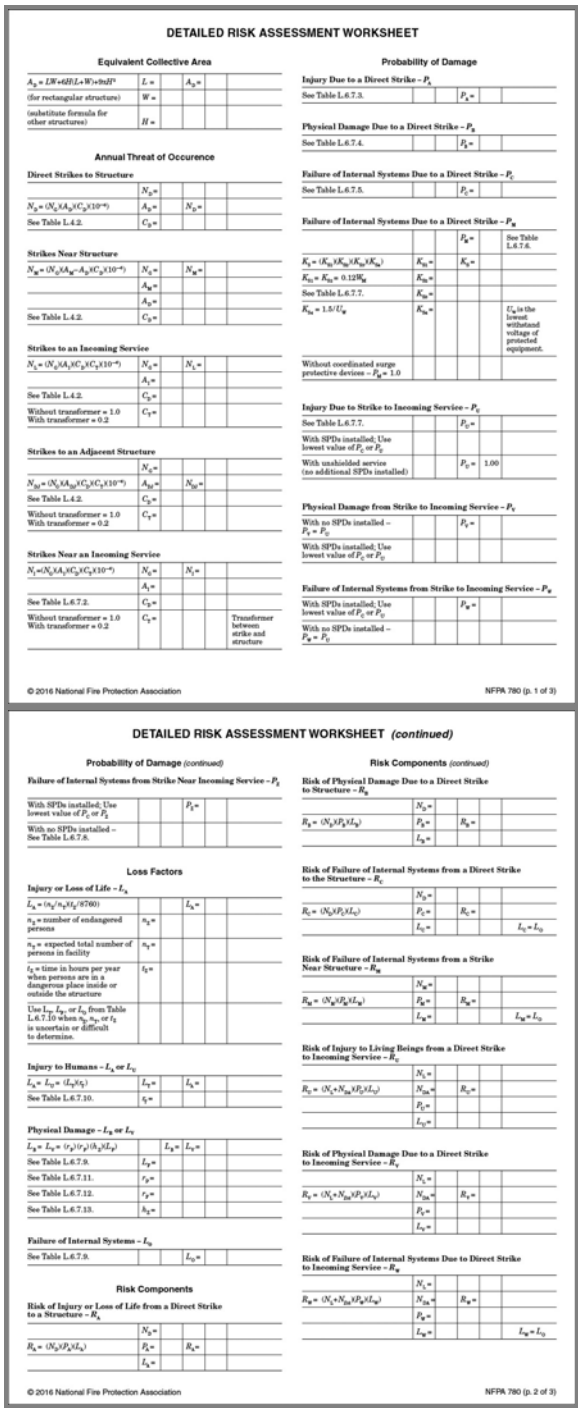
Resolution: The TG identified that the First Revision is CORRECT and the Public Comment is INCORRECT. The Technical Committee makes no change to the text.

Public Comment No. 70-NFPA 780-2015 [Section No. L.6.8]

L.6.8

Figure L.6.8 provides a worksheet for detailed risk assessment.

Figure L.6.8 Detailed Risk Assessment Worksheet.



DETAILED RISK ASSESSMENT WORKSHEET

Equivalent Collective Area

$A_D = LW + 6H(L+W) + 9\pi H^2$	$L =$		$A_D =$		
(for rectangular structure)	$W =$				
(substitute formula for other structures)	$H =$				

Annual Threat of Occurence

Direct Strikes to Structure

	$N_D =$				
$N_D = (N_g)(A_D)(C_D)(10^{-6})$	$A_D =$		$N_D =$		
See Table L.4.2.	$C_D =$				

Strikes Near Structure

$N_M = (N_g)(A_M - A_D)(C_D)(10^{-6})$	$N_G =$		$N_M =$		
	$A_M =$				
	$A_D =$				
See Table L.4.2.	$C_D =$				

Strikes to an Incoming Service

$N_L = (N_g)(A_L)(C_D)(C_L)(10^{-6})$	$N_G =$		$N_L =$		
	$A_L =$				
See Table L.4.2.	$C_D =$				
Without transformer = 1.0 With transformer = 0.2	$C_T =$				

Strikes to an Adjacent Structure

	$N_G =$				
$N_{DJ} = (N_g)(A_{DJ})(C_D)(C_L)(10^{-6})$	$A_{DJ} =$		$N_{DJ} =$		
See Table L.4.2.	$C_D =$				
Without transformer = 1.0 With transformer = 0.2	$C_T =$				

Strikes Near an Incoming Service

$N_I = (N_g)(A_I)(C_D)(C_L)(10^{-6})$	$N_G =$		$N_I =$		
	$A_I =$				
See Table L.6.7.2.	$C_D =$				
Without transformer = 1.0 With transformer = 0.2	$C_T =$				Transformer between strike and structure

Probability of Damage

Injury Due to a Direct Strike – P_A

See Table L.6.7.3.			$P_A =$		

Physical Damage Due to a Direct Strike – P_B

See Table L.6.7.4.			$P_B =$		

Failure of Internal Systems Due to a Direct Strike – P_C

See Table L.6.7.5.			$P_C =$		

Failure of Internal Systems Due to a Direct Strike – P_M

			$P_M =$		See Table L.6.7.6.
$K_S = (K_{S1})(K_{S2})(K_{S3})(K_{S4})$	$K_{S1} =$		$K_S =$		
$K_{S1} = K_{S2} = 0.12 W_M$	$K_{S2} =$				
See Table L.6.7.7.	$K_{S3} =$				
$K_{S4} = 1.5/U_W$	$K_{S4} =$				U_W is the lowest withstand voltage of protected equipment.
Without coordinated surge protective devices – $P_M = 1.0$					

Injury Due to Strike to Incoming Service – P_U

See Table L.6.7.7.			$P_U =$		
With SPDs installed; Use lowest value of P_C or P_E					
With unshielded service (no additional SPDs installed)			$P_U =$	1.00	

Physical Damage from Strike to Incoming Service – P_V

With no SPDs installed – $P_V = P_C$			$P_V =$		
With SPDs installed; Use lowest value of P_C or P_E					

Failure of Internal Systems from Strike to Incoming Service – P_W

With SPDs installed; Use lowest value of P_C or P_E			$P_W =$		
With no SPDs installed – $P_W = P_C$					

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DETAILED RISK ASSESSMENT WORKSHEET *(continued)*

Probability of Damage *(continued)*

Failure of Internal Systems from Strike Near Incoming Service – P_Z

With SPDs installed; Use lowest value of P_C or P_Z			$P_Z =$		
With no SPDs installed – See Table L.6.7.8.					

Loss Factors

Injury or Loss of Life – L_A

$L_A = (n_p/n_t)(t_E/8760)$			$L_A =$		
n_p = number of endangered persons	$n_p =$				
n_t = expected total number of persons in facility	$n_t =$				
t_E = time in hours per year when persons are in a dangerous place inside or outside the structure	$t_E =$				
Use L_A, L_B, or L_C from Table L.6.7.10 when n_p, n_t, or t_E is uncertain or difficult to determine.					

Injury to Humans – L_A or L_U

$L_A = L_U = (L_T)(r_t)$	$L_U =$		$L_A =$		
See Table L.6.7.10.	$r_t =$				

Physical Damage – L_B or L_V

$L_B = L_V = (r_p)(r_f)(h_Z)(L_F)$			$L_B =$	$L_V =$	
See Table L.6.7.9.	$L_F =$				
See Table L.6.7.11.	$r_p =$				
See Table L.6.7.12.	$r_f =$				
See Table L.6.7.13.	$h_Z =$				

Failure of Internal Systems – L_O

See Table L.6.7.9.			$L_O =$		

Risk Components

Risk of Injury or Loss of Life from a Direct Strike to a Structure – R_A

	$N_D =$				
$R_A = (N_D)(P_A)(L_A)$	$P_A =$		$R_A =$		
	$L_A =$				

Risk Components *(continued)*

Risk of Physical Damage Due to a Direct Strike to Structure – R_B

	$N_D =$				
$R_B = (N_D)(P_B)(L_B)$	$P_B =$		$R_B =$		
	$L_B =$				

Risk of Failure of Internal Systems from a Direct Strike to the Structure – R_C

	$N_D =$				
$R_C = (N_D)(P_C)(L_O)$	$P_C =$		$R_C =$		
	$L_O =$				$L_O = L_O$

Risk of Failure of Internal Systems from a Strike Near Structure – R_M

	$N_M =$				
$R_M = (N_M)(P_M)(L_M)$	$P_M =$		$R_M =$		
	$L_M =$				$L_M = L_O$

Risk of Injury to Living Beings from a Direct Strike to Incoming Service – R_U

	$N_L =$				
$R_U = (N_L + N_{DA})(P_U)(L_T)$	$N_{DA} =$		$R_U =$		
	$P_U =$				
	$L_T =$				

Risk of Physical Damage Due to a Direct Strike to Incoming Service – R_V

	$N_L =$				
$R_V = (N_L + N_{DA})(P_V)(L_F)$	$N_{DA} =$		$R_V =$		
	$P_V =$				
	$L_F =$				

Risk of Failure of Internal Systems Due to Direct Strike to Incoming Service – R_W

	$N_L =$				
$R_W = (N_L + N_{DA})(P_W)(L_O)$	$N_{DA} =$		$R_W =$		
	$P_W =$				
	$L_O =$				$L_O = L_O$

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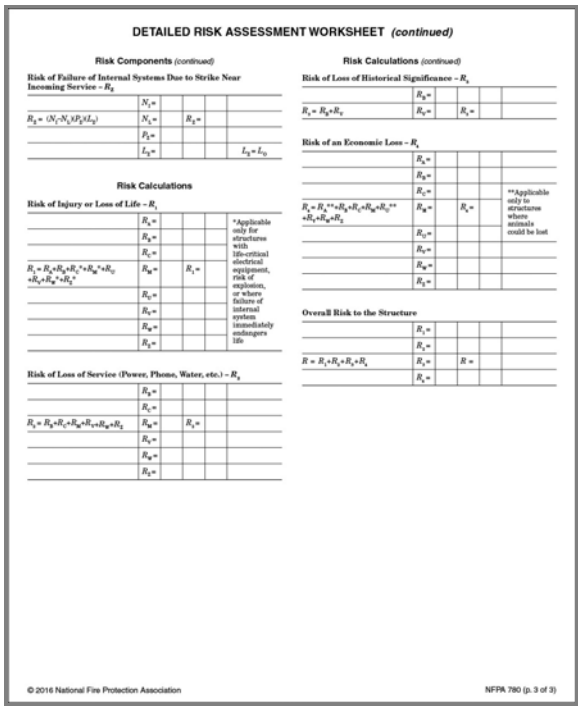

DETAILED RISK ASSESSMENT WORKSHEET *(continued)*

Risk Components *(continued)*

Risk of Failure of Internal Systems Due to Strike Near Incoming Service – R_E

	$N_J =$				
$R_E = (N_J - N_J)(P_E)(L_E)$	$N_J =$		$R_E =$		
	$P_E =$				
	$L_E =$				$L_E = L_O$

Risk Calculations

Risk of Injury or Loss of Life – R_1

	$R_A =$			*Applicable only for structures with life-critical electrical equipment, risk of explosion, or where failure of internal system immediately endangers life
	$R_B =$			
	$R_C =$			
$R_1 = R_A + R_B + R_C^* + R_M^* + R_U + R_V^* + R_W^* + R_Z^*$	$R_M =$		$R_1 =$	
	$R_U =$			
	$R_V =$			
	$R_W =$			
	$R_Z =$			

Risk of Loss of Service (Power, Phone, Water, etc.) – R_2

	$R_B =$			
	$R_C =$			
$R_2 = R_B + R_C + R_M + R_U + R_V + R_Z$	$R_M =$		$R_2 =$	
	$R_U =$			
	$R_V =$			
	$R_Z =$			

Risk Calculations *(continued)*

Risk of Loss of Historical Significance – R_3

	$R_B =$			
$R_3 = R_B + R_V$	$R_V =$		$R_3 =$	

Risk of an Economic Loss – R_4

	$R_A =$			
	$R_B =$			
	$R_C =$			**Applicable only to structures where animals could be lost
$R_4 = R_A^{**} + R_B + R_C + R_M + R_U^{**} + R_V + R_W + R_Z$	$R_M =$		$R_4 =$	
	$R_U =$			
	$R_V =$			
	$R_W =$			
	$R_Z =$			

Overall Risk to the Structure

	$R_1 =$			
	$R_2 =$			
$R = R_1 + R_2 + R_3 + R_4$	$R_1 =$		$R =$	
	$R_3 =$			

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Additional Proposed Changes

File Name	Description	Approved
Changes_to_Figure_L.docx		

Statement of Problem and Substantiation for Public Comment

This comment corrects a typo on page 1 of the Table.
This submittal also makes changes to the Loss Factors section to clarify the difference between Loss of Life and Injury and to be consistent with the body text of the Annex is Section L.6.6.3.1

Related Item

First Revision No. 144-NFPA 780-2014 [Section No. L.6.8]

Submitter Information Verification

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Submittal Date: Sat May 09 13:09:44 EDT 2015

Committee Statement

Committee Action: Rejected

Resolution: The corrected text properly reflects the text as submitted in the First Revision. The Technical Committee does not edit Loss Factors and Injury to Humans On Page 2; as PC-68 was rejected.

Public Comment No. 97-NFPA 780-2015 [Section No. O.1.2.8]

O.1.2.8 Other Publications.

López, R. E., and L. R. Holle. “Lightning Casualties and Damages in the United States from 1959 to 1994,” *Journal of Climate*, 13 Issue 19 (October 2000): 3448–3464.

Moore, C. B., W. Rison, J. Mathis, and G. Aulich. “Lightning Rod Improvement Studies,” *Journal of Applied Meteorology*, 39:593–609.

Guthrie, Mitchell and Alain Rousseau, “Lightning Related Ignition Mechanism an Associated Protection Techniques for Storage Applications,” *Proceedings of 9th Global Conference on Process Safety*, May 2013.

Statement of Problem and Substantiation for Public Comment

The addition of the citation provides access information for the paper discussed in annex material proposed in PC-95.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 53-NFPA 780-2015 [New Section after 7.4.2.2]	original text
Public Comment No. 95-NFPA 780-2015 [New Section after A.7.4.1.2]	annex material containing reference

Related Item

First Revision No. 146-NFPA 780-2014 [Chapter 7]

Submitter Information Verification

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Submittal Date: Fri May 15 14:46:44 EDT 2015

Committee Statement

Committee Action: Rejected
Resolution: The submitter introduces new material that has not had the opportunity for public review.