



NATIONAL FIRE PROTECTION ASSOCIATION

The leading information and knowledge resource on fire, electrical and related hazards

AGENDA

Technical Committee on Helicopter Facilities (HHH-AAA) NFPA 418 First Draft Meeting (F2023)

Monday, April 25 - Friday, April 29, 2022

and

Monday, May 2 and Tuesday, May 3 (May 2 and May 3, if necessary)
1 p.m. – 5 p.m. (ET)

Web/Teleconference

To join the meeting, please contact ksmith@nfpa.org

1. **Call to order.** Rex J. Alexander.
2. **Introductions.** See committee roster attached.
3. **Chair report.** Rex J. Alexander.
4. **Staff liaison report.** Kevin Carr.
5. **Previous meeting minutes.** December 8, 2021/Web/Teleconference. See attached.
6. **NFPA 418 First Draft.**
 - a. **Public Inputs.** See attached.
 - b. **Task group report(s).**
 - i. **TG#1, New Technologies.** Syms.
7. **Other Business.**
8. **Future meetings.**
9. **Adjournment.**

Address List No Phone

01/24/2022

Kevin Carr

HHH-AAA

Helicopter Facilities

Rex J. Alexander Chair Five-Alpha LLC 12308 Redding Drive Fort Wayne, IN 46814-9777 The Vertical Flight Society (VFS)	U 10/27/2009 HHH-AAA	Steve C. Berry Principal National Air Transportation Association (NATA) 818 Connecticut Avenue, NW Suite 900 Washington, DC 20006	C 12/07/2021 HHH-AAA
Anthony Colletto, Jr. Principal Colletto Services 448 West 19th Street 104 Houston, TX 77008-3914	SE 07/29/2013 HHH-AAA	Craig W. Cook Principal Johnson Controls 2700 Industrial Parkway South Marinette, WI 54143-3882 Alternate: John H. Pecot	M 08/17/2017 HHH-AAA
Steven W. Dellasanta Principal JENSEN HUGHES 117 Metro Center Boulevard Suite 1002 Warwick, RI 02886	SE 08/08/2019 HHH-AAA	Christopher A. Martino Principal Helicopter Association International (HAI) 1920 Ballenger Avenue 4th Floor Alexandria, VA 22314	U 08/17/2018 HHH-AAA
Edward Orazine Principal Engineering Planning & Management, Inc. (EPM) 959 Concord Street Framingham, MA 01701	SE 8/9/2011 HHH-AAA	Jack Poole Principal Poole Fire Protection, Inc. 19910 West 161st Street Olathe, KS 66062-2700	SE 10/10/1998 HHH-AAA
Mark Siem Principal Perimeter Solutions/ The Solberg Company 1520 Brookfield Avenue Green Bay, WI 54313 Alternate: Joseph M. Pada	M 08/17/2015 HHH-AAA	Dudley G. Smith Principal Dudley Smith Consulting 8745 Quietwood Lane Cleves, OH 45002 Association of Air Medical Services & MedEvac Foundation International	U 1/15/1999 HHH-AAA
Raymond A. Syms Principal HeliExperts International LLC 489 Broadway Long Branch, NJ 07740	SE 1/1/1988 HHH-AAA	Martin H. Workman Principal The Viking Corporation 5150 Beltway Drive South East Caledonia, MI 49316	M 08/17/2018 HHH-AAA
Joseph M. Pada Alternate Perimeter Solutions 1520 Brookfield Avenue Green Bay, WI 54313 Principal: Mark Siem	M 12/02/2020 HHH-AAA	John H. Pecot Alternate Johnson Controls 3415 Norwood Circle Richardson, TX 75082 Principal: Craig W. Cook	M 04/11/2018 HHH-AAA

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Helicopter Facilities

Kevin Carr 8/12/2020

Staff Liaison **HHH-AAA**

National Fire Protection Association

One Batterymarch Park

Quincy, MA 02169



NATIONAL FIRE PROTECTION ASSOCIATION

The leading information and knowledge resource on fire, electrical and related hazards

MINUTES

NFPA Technical Committee on Helicopter Facilities (HHH-AAA) NFPA 418 Pre-First Draft Meeting

December 8, 2021
1:00pm – 5:00pm (Eastern)

Web/Teleconference

1. **Call to order.** Rex J. Alexander, chair, called the meeting to order at 1:03pm on December 8, 2021.
2. **Introductions.** Attendees introduced themselves and identified their affiliation. NFPA staff took attendance.
3. **Chair report.** Rex J. Alexander welcomed attendees and provided an overview of the meeting.
4. **Staff liaison report.** Kevin Carr provided an overview of important dates and objectives of the meeting.
5. **Previous meeting minutes.** The minutes from May 5, 2020 were approved without revision.
6. **NFPA 418 Pre-First Draft Meeting.**
 - a. **Task group report.** The following task groups provided their reports and recommendations.
 - i. **TG#1, New Technologies.** Ray Syms, task group chair. The task group (roster attached) provided a report, and suggestions from technical committee members and guests were provided. The task group will review these suggestions and provide a report at the First Draft meeting.
7. **Pre-First Draft Technical Committee Discussion Topics.** The members present discussed topics for consideration from the Pre-First Draft agenda. No actions were taken.
8. **Task Groups.** Task Group #1, New Technologies, will continue work and provide a report at the First Draft meeting. No additional task groups were established.
9. **Membership Discussion.** Rex. J. Alexander encouraged technical committee members and guests to contact interested parties to have them consider applying for membership on the technical committee via the NFPA standards development process.
10. **Other Business.** The technical committee discussed reviewing data and research pertaining to heliport fires.

11. Future meetings. The next committee meeting to be determined. A meeting notification will be posted at www.nfpa.org/418, when the next meeting is scheduled.

12. Adjournment. The meeting was adjourned at 4:25pm on December 8, 2021.

Attendees

Committee Members:

✓	Alexander, Rex	Chair	The Vertical Flight Society (VFS)
✓	Colletto, Anthony	Principal	Colletto Services
	Cook, Craig	Principal	Johnson Controls
✓	Dellasanta, Steven	Principal	JENSEN HUGHES
✓	Martino, Christopher	Principal	Helicopter Association International
✓	Orazine, Edward	Principal	Engineering Planning & Management, Inc.
✓	Poole, Jack	Principal	Poole Fire Protection, Inc.
✓	Siem, Mark	Principal	Perimeter Solutions/ The Solberg
✓	Smith, Dudley	Principal	Association of Air Medical Services &
✓	Syms, Raymond	Principal	HeliExperts International LLC
✓	Workman, Martin	Principal	The Viking Corporation
	Pada, Joseph	Alternate	Perimeter Solutions
✓	Pecot, John	Alternate	Johnson Controls
✓	Carr, Kevin	Staff Liaison	National Fire Protection Association

Guests:

Michael Coddington	National Renewable Energy Lab (NREL)
Keith Gallo	Gannett Fleming
Klemintina Gerova	Atkins
Oren Hanson	Tampa International Airport
Aaron Johnson	Aaron Johnson LLC
Melissa Meade	Woolpert
Ryan Naru	Joby Aviation
Matthew Paiss	Pacific Northwest National Laboratory
Larry Satterfield	Federal Aviation Administration (FAA)

*All participated by teleconference

Total number in attendance: 21

6,a,i: TG#1 Roster, New Technologies

First Name	Last Name	Company
Rex	Alexander	Five-Alpha
Dan	Balto	PS&S
Michael	Coddington	NREL
Bob	Davidson	Davidson Code Concepts
Keith	Gallo	Gannett Fleming
Klementna	Gerova	Atkins
Andrew	Giacini	Skyports
Oren	Hanson	Tampa Int. Airport
Aaron	Johnson	Aaron Johnson LLC.
Simon	Jones	Director & Owner
Chris	Martino	Helicopter Association Int.
Melissa	Meade	Woolpert
Ryan	Naru	Joby Aviation
Edward	Orazine	EPM, Inc
Todd	Stevens	Industrial Fire Protection
Ray	Syms	HeliExperts International LLC (TG Chair)
Marc	Tonnacliff	FAA
Jim	Zimmerman	Woolpert



Public Input No. 44-NFPA 418-2022 [Global Input]

NFPA 418 Standard for Heliports and Vertiports

Statement of Problem and Substantiation for Public Input

This is a proposed change to the title of NFPA 418. The title changes indicates the applicability of the document to both, heliports and vertiports.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 6-NFPA 418-2022 [Section No. 1.2]</u>	

Submitter Information Verification

Submitter Full Name: Aaron Johnson
Organization: [Not Specified]
Affiliation: Vertiports Task Group
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 04 12:03:40 EST 2022
Committee: HHH-AAA



Public Input No. 61-NFPA 418-2022 [Global Input]

Change references to FAA AC150/5390-2C to AC150/5390-2D

Statement of Problem and Substantiation for Public Input

updated version of FAA AC150/5390-2C strongly anticipated to be published and in effect as AC150/5390-2D ahead of the publication and effective date for NFPA418-2023

Submitter Information Verification

Submitter Full Name: Peter Simpson
Organization: PSNK Aeronautical Services
Affiliation: Nil affiliations
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 05 01:12:40 EST 2022
Committee: HHH-AAA



Public Input No. 5-NFPA 418-2022 [Section No. 1.1.1]

1.1.1

This standard specifies the minimum requirements for fire protection for heliports, vertiports, helistops, vertiports, vertistops, and rooftop hangars.

Statement of Problem and Substantiation for Public Input

This change brings the term "helistop" into NFPA 418, which is already defined by other NFPA standards, and is a term that is referenced by the FAA, IFC and IBC. While a helistop is a form of heliport, there are specific differences that, while do not apply at the federal level, do apply at the municipality level which an AHJ needs to take into consideration.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 6-NFPA 418-2022 [Section No. 1.2]</u>	

Submitter Information Verification

Submitter Full Name: Aaron Johnson
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Submittal Date: Tue Jan 04 09:20:20 EST 2022
Committee: HHH-AAA



Public Input No. 81-NFPA 418-2022 [Section No. 1.1.1]

1.1.1

This standard specifies the minimum requirements for fire protection for heliports, helistop, vertiports, vertistops, and rooftop hangars.

Statement of Problem and Substantiation for Public Input

The term "Helistop" is currently utilized in NFPA-418 in the Committee Scope statement, i.e. " This Committee shall have primary responsibility for documents on the fire protection criteria for the design and construction of elevated and ground level heliports, helistops, and helipads:..." As such, section 1.1.1 should include the term "Helistop" for maximum clarity.

Submitter Information Verification

Submitter Full Name: Rex Alexander
Organization: Five-Alpha LLC
Affiliation: Vertical Flight Society
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 05 08:28:22 EST 2022
Committee: HHH-AAA



Public Input No. 6-NFPA 418-2022 [Section No. 1.2]

1.2 Purpose.

The purpose of this standard is to establish minimum fire safety requirements for ~~operation~~ operations at heliports- ~~for~~ , helistops, vertiports, and vertistops, for the protection of persons, aircraft, and other property. (See *Annex B, Heliport Emergency Planning and Training for Safety Personnel.*)

Statement of Problem and Substantiation for Public Input

This change brings the term "helistop" into NFPA 418, which is already defined by other NFPA standards, and is a term that is referenced by the FAA, IFC and IBC. While a helistop is a form of heliport, there are specific differences that, while do not apply at the federal level, do apply at the municipality level which an AHJ needs to take into consideration.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 5-NFPA 418-2022 [Section No. 1.1.1]	
Public Input No. 44-NFPA 418-2022 [Global Input]	

Submitter Information Verification

Submitter Full Name: Aaron Johnson
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State:
Zip:
Submittal Date: Tue Jan 04 09:23:24 EST 2022
Committee: HHH-AAA



Public Input No. 51-NFPA 418-2022 [New Section after 1.3]

TITLE OF NEW CONTENT

Design Objectives

Statement of Problem and Substantiation for Public Input

Design Objectives for Heliport/Vertiport are not presented in NFPA418-2021. Application of included provisions for New Technology under 1.3.1 not possible as current standard prescribes use of only AFFF retardant systems. Required performance in terms of system activation time, method of activation, time to achieve fire control, definition of fire control cannot be identified in current 418 as an objective benchmark to guide system designers and AHJ. NFPA15-2022 has Design Objectives in Section 4.1 of Chapter 4 (General requirements) and in Chapter 7 Design Objectives covering a range of topics equally relative to heliports and vertiports - system design; extinguishment; design density; automatic detection equipment. NFPA418-2021 nominates one minute as "both a reasonable and a necessary operational objective" for the time required to achieve control - but only in Appendix C for "informational purposes only".

ICAO annex 14 Volume II (5th Ed, 2020) nominates (6.2.2.1) that system design "shall be predicated on a requirement to bring any fire which may occur on the heliport under control within one minute, measured from activation of the system at the appropriate discharge rate" and includes a recommendation (6.2.4.2) that "At elevated heliports, limited-sized surface-level heliports and helidecks, the response time for the discharge of primary media at the required application rate should be 15 seconds measured from system activation".

Presentation of performance criteria to inform stakeholders of what to achieve as background knowledge to information on how to achieve the intended result is requested. It is suggested for inclusion in Chapter 1 to apply equally to subsequent chapters including the new provisions in Chapter 11.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 50-NFPA 418-2022 [Section No. 1.3.1]	Identification of performance criteria for New Technology
Public Input No. 52-NFPA 418-2022 [Section No. 2.2]	
Public Input No. 54-NFPA 418-2022 [New Section after 2.3.3]	
Public Input No. 63-NFPA 418-2022 [Section No. 5.7.1 [Excluding any Sub-Sections]]	
Public Input No. 64-NFPA 418-2022 [Section No. 5.7.2.6.1]	
Public Input No. 65-NFPA 418-2022 [Section No. 5.7.1.3]	
Public Input No. 70-NFPA 418-2022 [Section No. 5.7.2]	
Public Input No. 71-NFPA 418-2022 [Section No. 5.7.2.1]	
Public Input No. 72-NFPA 418-2022 [Section No. 5.7.2.2]	
Public Input No. 73-NFPA 418-2022 [Section No. 5.7.2.3]	

Public Input No. 82-NFPA 418-2022 [Section No. 5.7.8.2]

Public Input No. 92-NFPA 418-2022 [Section No. A.3.3.3]

Submitter Information Verification

Submitter Full Name: Peter Simpson

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Affiliation: Nil affiliations

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City:

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Zip:

Submittal Date: Tue Jan 04 21:20:58 EST 2022

Committee: HHH-AAA



Public Input No. 50-NFPA 418-2022 [Section No. 1.3.1]

1.3.1

Nothing in this standard shall be intended to restrict new technologies or alternative arrangements, provided the level of safety prescribed by this standard is not lowered.

1.5 Equivalency.

Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard. Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency. The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

Statement of Problem and Substantiation for Public Input

Proposed text from 2022-NFPA15 Clause 1.5 wording is more descriptive than standard wording and highlights the fact that system approval is by AHJ.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 51-NFPA 418-2022 [New Section after 1.3]	
Public Input No. 52-NFPA 418-2022 [Section No. 2.2]	
Public Input No. 54-NFPA 418-2022 [New Section after 2.3.3]	
Public Input No. 92-NFPA 418-2022 [Section No. A.3.3.3]	

Submitter Information Verification

Submitter Full Name: Peter Simpson
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Submittal Date: Tue Jan 04 20:54:52 EST 2022
Committee: HHH-AAA



Public Input No. 52-NFPA 418-2022 [Section No. 2.2]

2.2 NFPA Publications.

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

NFPA 10, *Standard for Portable Fire Extinguishers*, 2018 [edition](#).

NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*, 2021 [edition](#).

NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2019 [edition](#).

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2019 [edition](#).

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, 2022 [edition](#)

NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*, 2019 [edition](#).

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2020 [edition](#).

NFPA 30, *Flammable and Combustible Liquids Code*, 2021 [edition](#).

NFPA 70[®], *National Electrical Code*[®], 2020 [edition](#).

NFPA 72[®], *National Fire Alarm and Signaling Code*[®], 2019 [edition](#).

NFPA 99, *Health Care Facilities Code*, 2021 [edition](#).

NFPA 101[®], *Life Safety Code*[®], 2021 [edition](#).

NFPA 220, *Standard on Types of Building Construction*, 2021 [edition](#).

NFPA 407, *Standard for Aircraft Fuel Servicing*, 2017 [edition](#).

NFPA 409, *Standard on Aircraft Hangars*, 2021 [edition](#).

NFPA 780, *Standard for the Installation of Lightning Protection Systems*, 2020 [edition](#).

Statement of Problem and Substantiation for Public Input

Inclusion of NFPA 15 provides relevant details of system design components and operation that can be attributable to heliports/vertiports with passive self-draining surfaces in tandem with water based DIFFS

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 50-NFPA 418-2022 [Section No. 1.3.1]	Performance criteria for new technology system
Public Input No. 51-NFPA 418-2022 [New Section after 1.3]	Performance criteria for new technology system

Submitter Information Verification

Submitter Full Name: Peter Simpson
Organization: PSNK Aeronautical Services
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Submittal Date: Tue Jan 04 22:29:08 EST 2022

Committee: HHH-AAA



Public Input No. 7-NFPA 418-2022 [Section No. 2.2]

2.2 NFPA Publications.

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

[NFPA 2, Hydrogen Technologies Code, 2020 edition.](#)

[NFPA 10, Standard for Portable Fire Extinguishers, 2018 edition.](#)

[NFPA 11, Standard for Low-, Medium-, and High-Expansion Foam, 2021 edition.](#)

[NFPA 13, Standard for the Installation of Sprinkler Systems, 2019 edition.](#)

[NFPA 14, Standard for the Installation of Standpipe and Hose Systems, 2019 edition.](#)

[NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, 2019 edition.](#)

[NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, 2020 edition.](#)

[NFPA 30, Flammable and Combustible Liquids Code, 2021 edition.](#)

[NFPA 70[®], National Electrical Code[®], 2020 edition.](#)

[NFPA 70E, Standard for Electrical Safety in the Workplace, 2021 edition.](#)

[NFPA 72[®], National Fire Alarm and Signaling Code[®], 2019 edition.](#)

[NFPA 99, Health Care Facilities Code, 2021 edition.](#)

[NFPA 101[®], Life Safety Code[®], 2021 edition.](#)

[NFPA 220, Standard on Types of Building Construction, 2021 edition.](#)

[NFPA 407, Standard for Aircraft Fuel Servicing, 2017 edition.](#)

[NFPA 409, Standard on Aircraft Hangars, 2021 edition.](#)

[NFPA 410, Standard on Aircraft Maintenance, 2020 edition.](#)

[NFPA 780, Standard for the Installation of Lightning Protection Systems, 2020 edition.](#)

[NFPA 855, Standard for the Installation of Stationary Energy Storage Systems, 2020 edition](#)

Statement of Problem and Substantiation for Public Input

Adds new references to be included within the document. These will be referred to in relation to vertiports and vertistops.

Submitter Information Verification

Submitter Full Name: Aaron Johnson

Organization: [Not Specified]

Affiliation: Vertiports Task Group

Street Address:

City:

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Submittal Date: Tue Jan 04 09:25:38 EST 2022

Committee: HHH-AAA



Public Input No. 53-NFPA 418-2022 [Section No. 2.3.2]

2.3.2 FAA Publications.

Federal Aviation Administration, US Department of Transportation, 1200 New Jersey Avenue, SE, Washington, DC 20590.

FAA AC 150/5390-

2C

2D , *Heliport Design Advisory Circular* ,

April 24

tba ,

2012

2022 .

Statement of Problem and Substantiation for Public Input

New 2022 version of FAA AC strongly anticipated to be published before the publication date of NFPA418-2023

Submitter Information Verification

Submitter Full Name: Peter Simpson

Organization: PSNK Aeronautical Services

Affiliation: nil affiliations

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Submittal Date: Tue Jan 04 22:38:23 EST 2022

Committee: HHH-AAA



Public Input No. 8-NFPA 418-2022 [Section No. 2.3.2]

2.3.2 FAA Publications.

Federal Aviation Administration, US Department of Transportation, 1200 New Jersey Avenue, SE, Washington, DC 20590.

FAA AC 150/5390-2C 2D , *Heliport Design Advisory Circular*, ~~April 24~~ January 5 , 2012 2022 .

FAA AC 150/5390-3(_), *Vertiport Design*

Statement of Problem and Substantiation for Public Input

FAA AC 150/5390-2D will be the next revision of the FAA design advisory circular which will replace the current 2C. This is currently in draft form, estimated release date is Dec 2021.

Currently, the FAA vertiport standard has not been published, therefore this version is represented with an "(_)" with the understanding that it will need to be changed to reflect the correct standard iteration. If this document has not been published before the NFPA-418 standard is ready for submission, this reference will need to be removed from the NFPA-418 document.

Submitter Information Verification

Submitter Full Name: Aaron Johnson

Organization: [Not Specified]

Affiliation: Vertiports Task Group

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Submittal Date: Tue Jan 04 09:30:07 EST 2022

Committee: HHH-AAA



Public Input No. 54-NFPA 418-2022 [New Section after 2.3.3]

TITLE OF NEW CONTENT

ICAO Publications

Annex 14 Volume II *Heliports* (Fifth Edition, July 2020) - Chapter 6 Heliport Emergency Response

Doc 9261 *Heliport Manual* (Fifth edition, 2021)

Statement of Problem and Substantiation for Public Input

Current version and recent of ICAO documents with relevance to planning design and operation of heliport fire protection systems

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 50-NFPA 418-2022</u> [Section No. 1.3.1]	design and performance criteria for New (and conventional) Technology echnology
<u>Public Input No. 51-NFPA 418-2022</u> [New Section after 1.3]	design and performance criteria for heliport systems

Submitter Information Verification

Submitter Full Name: Peter Simpson
Organization: PSNK Aeronautical Services
Affiliation: Nil affiliations
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Submittal Date: Tue Jan 04 22:43:00 EST 2022
Committee: HHH-AAA



Public Input No. 4-NFPA 418-2021 [Section No. 2.3.4]

2.3.4 UL Publications.

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

UL 162, *Foam Equipment and Liquid Concentrates*, 2018 2022 .

UL 790, *Test Methods for Fire Tests of Roof Covering*, 2004, revised 2018.

Statement of Problem and Substantiation for Public Input

Update UL 162 edition reference, the new edition is scheduled to be published early in 2022.

Submitter Information Verification

Submitter Full Name: Kelly Nicoletto

Organization: UL

Street Address:

City:

State:

Zip:

Submittal Date: Thu Dec 30 13:53:59 EST 2021

Committee: HHH-AAA



Public Input No. 20-NFPA 418-2022 [Section No. 2.3.5]

2.3.5 U.S. Government Publications.

US Government Publishing Office, 732 North Capitol Street, NW, Washington, DC 20401-0001.

Military Specification, MIL-F-24385 (Navy), "Fire Extinguishing Agent, Aqueous Film Forming Foam (AFFF) Liquid Concentrate, For Fresh and Sea Water," 21 November, 1969 (and all revisions and amendments thereto) and synthetic foam concentrate without Fluorine and Added PFOS, synthetic foam concentrate shall be Listed or Approved and shall meet the minimum performance standard level of ICAO-B .

Statement of Problem and Substantiation for Public Input

The FAA Reauthorization Act of 2018 requires the administration using the latest version of NFPA-403 and in coordination with manufacturers and airports shall not require the use of fluorinated chemicals to meet the performance standards as stated in CFR 139.319 (1) of title 14 no later than October 2021.

Submitter Information Verification

Submitter Full Name: Gnanesh Rudrapada

Organization: Marsol Technologies Inc

Street Address:

City:

State:

Zip:

Submittal Date: Tue Jan 04 10:51:20 EST 2022

Committee: HHH-AAA



Public Input No. 9-NFPA 418-2022 [Section No. 2.4]

2.4 References for Extracts in Mandatory Sections. (Reserved)
[NFPA 5000, Building Construction and Safety Code, 2021 edition.](#)

Statement of Problem and Substantiation for Public Input

Provides a reference for the definition of 'helistop'.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 10-NFPA 418-2022 [New Section after 3.3.5.1]	

Submitter Information Verification

Submitter Full Name: Aaron Johnson
Organization: [Not Specified]
Affiliation: Vertiports Task Group
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 04 09:35:29 EST 2022
Committee: HHH-AAA



Public Input No. 98-NFPA 418-2022 [Chapter 3]

Chapter 3 Definitions

3.1 General.

The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved.

Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ).

An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3* Listed.

Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.4 Shall.

Indicates a mandatory requirement.

3.2.5 Should.

Indicates a recommendation or that which is advised but not required.

3.2.6 Standard.

An NFPA Standard, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase "standards development process" or "standards development activities," the term "standards" includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3 General Definitions.

3.3.1 Area.

3.3.1.1* Critical Area.

The area calculated to be one-half the overall length of the helicopter multiplied by three times the width of the widest portion of the fuselage.

3.3.1.2 Helicopter Storage and Servicing Area.

That part of a rooftop hangar normally used for the storage and servicing of one or more helicopters, not including any adjacent or contiguous areas or structures, such as shops, storage areas, and offices.

3.3.1.3* Practical Critical Fire Area (PCA).

The area, for foam discharge purposes, calculated as one-half the fuselage length multiplied by three times the fuselage width.

3.3.2 Emergency Evacuation Facility.

A designated and clear area at rooftop or ground level intended exclusively for emergency/rescue operations by helicopters.

3.3.3* Foam Fire-Extinguishing System.

A low-expansion foam fire-extinguishing system.

3.3.4 Helipad Support Structure.

A structure used for helipad and/or helicopter maintenance or storage that is not classified as a rooftop hangar.

3.3.5* Heliport.

An identifiable area located on land, on water, or on a structure that also includes any existing buildings or facilities thereon, used or intended to be used for landing and takeoff of helicopters.

3.3.5.1 Offshore Landing Heliport.

A heliport located on fixed or mobile structures and vessels in a marine environment that do not have means of entry and egress connected directly to shore.

3.3.6* Overall Length.

The length of a helicopter from the main rotor fully extended to the tail rotor fully extended.

3.3.7 Rooftop Hangar.

A structure on top of a building where helicopters are housed, stored, or maintained.

3.3.8 Rooftop Landing Pad.

The entire load-bearing surface intended for the touchdown and liftoff (TLOF) of helicopters.

3.3.9 Temporary Landing Site.

A site intended to be used for a period of less than 30 consecutive days, and for no more than 10 operations per day.

3.3.10 Vertiport.

A generic reference to the area of land, water, or structure used or intended to be used, for the landing and takeoff of vertical takeoff and landing (VTOL) aircraft, together with associated buildings and facilities.

3.3.10.1 Electric Takeoff and Landing (eVTOL). (Reserved)**3.3.10.2** Vertical Takeoff and Landing (VTOL). (Reserved)**3.3.11** Vertistop.

An area similar to vertiports, except that no fueling, defueling, maintenance, repairs, or storage of aircraft are permitted.

3.3.12 Final approach and takeoff area (FATO). A defined area over which the pilot completes the final phase of the approach to a hover or a landing and from which the pilot initiates takeoff.

3.3.13 Touchdown and liftoff area (TLOF). A load-bearing, generally paved area, normally centered in the FATO, on which the aircraft lands and/or takes off.

3.3.14 Safety area. A defined area surrounding the FATO intended to reduce the risk of damage to aircraft accidentally diverging from the FATO.

Statement of Problem and Substantiation for Public Input

The terms and their corresponding acronyms, Touchdown and Liftoff Area (TLOF) and Final Approach and Landing Area (FATO), while currently used in NFPA-418, are not actually defined in any NFPA standard. For maximum harmonization between the FAA design standard that introduces these terms, i.e. FAA AC 150/5390-2 it is recommended that these terms be defined using the same way definitions as are found in the FAA AC. Additionally it is recommend the third term, Safety Area, which is also used by the FAA in defining a heliports geometry included.

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Public Input No. 22-NFPA 418-2022 [New Section after 3.3]

In Deck Nozzle

In Deck Nozzles also known as DIFF (Deck Integrated Fire Fighting System) nozzles.

Statement of Problem and Substantiation for Public Input

In-Deck Nozzles are stated in the document. Most of the standards are using term" DIFFS" deck integrated fire fighting system. Hence it is recommended to add DIFFS in General Definition section.

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Committee: HHH-AAA



Public Input No. 75-NFPA 418-2022 [New Section after 3.3.4]

TITLE OF NEW CONTENT

Deck Integrated Fire Fighting System (DIFFS)

These systems typically consisting of a series of flush-mounted nozzles positioned over the surface of the practical critical area which, upon activation, are capable of delivering primary extinguishing agent to the entire load bearing area of the heliport.

Statement of Problem and Substantiation for Public Input

Inclusion of DIFFS within Definitions Section of -418 Standard recommended to reflect increasing use of technology and acronym. Wording copied from ICAO Doc 9261 Heliport Manual (2021) Clause II-6.4.2.5

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Public Input No. 55-NFPA 418-2022 [Section No. 3.3.4]

3.3.4 Helipad Operational Support Structure.

A ~~structure~~ facility used for helipad and/or helicopter maintenance or storage that is not classified as a rooftop hangar.

Statement of Problem and Substantiation for Public Input

The term 'Helipad Support' implies a physical element performing a structural support function as in Clause 5.2 and A5.2 and 5.7.1(1) rather than an operational support function

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Public Input No. 12-NFPA 418-2022 [New Section after 3.3.5]

3.3. Heliport or Vertiport Category. The heliport or vertiport category is based on the overall length and width, whichever is greater, of the largest design aircraft which is intended to use the facility and designated as either H-1, H-2, or H-3. (see Annex C for additional guidance)

3.3.X.1 H-1. A classification where both the aircraft's overall length and width are less than 50 ft (15.2m).

3.3.X.2 H-2. A classification where the aircraft's overall length or width is between 50 ft (15.2m), or up to, but not including 80 ft (24.4m).

3.3.X.3 H-3. A classification where the aircraft's overall length or width is between 80 ft (24.4m), or up to, but not including 120 ft (36.6m).

Statement of Problem and Substantiation for Public Input

The Heliport category H1, H2, and H3 are used in Table 5.7.3.1, Table 9.2, Table C.1(a) and Table C.1(b). However, these are not clearly defined until later in the document.

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Public Input No. 88-NFPA 418-2022 [New Section after 3.3.5]

Helistop

A heliport where no fueling, defueling, scheduled maintenance, scheduled repair, or storage of helicopters is permitted. (BLD-IND)

Statement of Problem and Substantiation for Public Input

NFPA-418 "Committee Scope" speaks to "Helistops as a primary responsibility. As such it is recommended that the term "Helistop" be defined in chapter 3.

The definition submitted is taken from NFPA 5000, Building Construction and Safety Code 2021, 3.3.323 Helistop. A heliport where no refueling, maintenance, repair, or storage of helicopters is permitted. (BLD-IND) and combined with the International Building Code (IBC) 2021 and International Fire Code (IFC) Definitions: HELISTOP. The same as "heliport," except that no fueling, defueling, maintenance, repairs or storage of helicopters is permitted.

Maintenance is further classified in the proposed definition as to what constitutes "scheduled" vs. "unscheduled" maintenance to assist the AHJ in determining when an aircraft is out of service due to a maintenance irregularity, i.e. in an AOG status, Aircraft On Ground, and repairs must be conducted onsite to return the aircraft to a flight worthy condition vs. when an aircraft has known scheduled maintenance coming due at a specific calendar date, hour time frame or cycle count.

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Public Input No. 10-NFPA 418-2022 [New Section after 3.3.5.1]

3.3.5.2 Helistop. A heliport where no refueling, maintenance, repair, or storage of helicopters is permitted.

Statement of Problem and Substantiation for Public Input

Brings the term “helistop” into NFPA 418 which is defined by other NFPA standards (NFPA 5000) and a term that is referenced by the FAA. There are significant differences between a heliport and a helistop as to the standards that may apply.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 9-NFPA 418-2022 [Section No. 2.4]</u>	

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Public Input No. 11-NFPA 418-2022 [New Section after 3.3.6]

3.3.6.1 Controlling Dimension.

The greatest distance between two outermost points on an aircraft that are opposite one another, with any adjustable or articulated components at their maximum outboard deflection.

Statement of Problem and Substantiation for Public Input

Provides for a dimensional standards that can be used in determining fire safety requirements based on aircraft size. This criteria is referenced in ASTM International Vertiport Standards Draft.

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Public Input No. 57-NFPA 418-2022 [New Section after 3.3.6]

TITLE OF NEW CONTENT

D or D-value

Refer to Overall Length

Statement of Problem and Substantiation for Public Input

Elevates D-value term to having its own definition heading. Could also repeat text used in Overall Length entry as a reciprocal cross-reference

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 56-NFPA 418-2022 [Section No. 3.3.6]</u>	Cross reference in overall length and D-value definitions
<u>Public Input No. 79-NFPA 418-2022 [Section No. 5.7.3.1]</u>	
<u>Public Input No. 89-NFPA 418-2022 [Section No. 9.2]</u>	

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Public Input No. 47-NFPA 418-2022 [Section No. 3.3.6]

3.3.6* Overall Length.

The length of a helicopter from the main rotor fully extended to the tail rotor fully extended

Controlling Dimension.

The greatest distance between two outermost points on an aircraft that are opposite one another, e.g., wingtip to wingtip, rotor tip to rotor tip, rotor tip to wingtip, etc... with any adjustable or articulated components at their maximum outboard deflection .

Statement of Problem and Substantiation for Public Input

Suggest this edit be made throughout the standard in order to better accommodate future platforms.

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Public Input No. 56-NFPA 418-2022 [Section No. 3.3.6]

3.3.6* Overall Length.

The length of a helicopter from the main rotor fully extended to the tail rotor fully extended. The overall length of a helicopter is also referred to by some authorities as D or the D-value.

Statement of Problem and Substantiation for Public Input

D-value reference were added to NFPA418-2021 as foot notes to Table 5.7.3.1 and to Table 9.2 as well as the text added here which is copied form Clause A3.3.6 in 418-2021. Change reflects clarification and acknowledgement of the use of the D-value term (which is anticipated to also be included in the FAA AC150/5390-2D version)

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 57-NFPA 418-2022 [New Section after 3.3.6]</u>	

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Public Input No. 93-NFPA 418-2022 [Section No. 3.3.11]

3.3.11 Vertistop.

An area similar to vertiports, except that no fueling, defueling, scheduled maintenance, scheduled repairs, or storage of aircraft are permitted.

Statement of Problem and Substantiation for Public Input

There are two primary types of maintenance that should be considered in this section. The first being scheduled, i.e. those maintenance items that are known to be due at a specific calendar date, hour accumulation or cycle accumulation. The second being unscheduled, i.e. when the aircraft out-of-service due to an unplanned mechanical irregularity. This is oftentimes referred to as an AOG status or Aircraft On Ground. By including this differentiation, it will allow for clearer guidance as to when it is acceptable for maintenance to be conducted at a vertistop. Otherwise, some AHJs may interpret that no maintenance of any kind may ever be performed at a vertistop even when the aircraft is out of service and in need of only a minor repair to facilitate it being flown out of the site.

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Public Input No. 13-NFPA 418-2022 [Section No. 4.1.1 [Excluding any Sub-Sections]]

This chapter shall provide requirements for the correct use of heliport, helistop, vertiport, and vertistop firefighting system components.

Statement of Problem and Substantiation for Public Input

Incorporates reference to, and applicability to, helistops, vertiports and vertistops.

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Public Input No. 58-NFPA 418-2022 [Sections 4.1.1.1, 4.1.1.2]

Sections 4.1.1.1, 4.1.1.2

4.1.1.1

All components shall be listed for their intended use.

4.1.1.2 –

Where listings for components do not exist, components shall be approved.

Statement of Problem and Substantiation for Public Input

The existing clauses are related with Clause 4.1.1.2 qualifying 4.1.1.1 by an 'if' statement rather than being a separate stand-alone statement. combination provides a joint condition for compliance as being listed or otherwise approved/accepted by AHJ

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Public Input No. 14-NFPA 418-2022 [Section No. 4.2]

4.2* Plans.

4.2.1

The design drawings for the construction and protection of the heliport- ~~shall~~ , helistop, vertiport, or vertistop shall be approved by the authority having jurisdiction.

4.2.2

The design of the heliport or helistop , including all the aeronautical components, shall be in accordance with FAA AC 150/5390-2G 2D , *Heliport Design Advisory Circular*.

4.2. 2.1 The design of the vertiport or vertistop, including all aeronautical components, shall be in accordance with FAA AC 150/5390- 3 (), *Vertiport Design Advisory Circular*.

4.2.3

The final approach and takeoff (FATO) area, the approach/departure path, and the touchdown and liftoff (TLOF) area shall be designated on the design drawings.

Statement of Problem and Substantiation for Public Input

Incorporates reference to, and applicability to, helistops, vertiports and vertistops.
Directs the user of NFPA 418 to the proper advisory circular for either heliports/helistops or vertiports/vertistops.

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Public Input No. 59-NFPA 418-2022 [Section No. 4.2.2]

4.2.2

The design of the heliport, including all the aeronautical components, shall be in accordance with FAA AC 150/5390-2G 2D , *Helicopter Design Advisory Circular* or equivalent Standards and Recommended Practices at locations where non-FAA regulatory environments exist .

Statement of Problem and Substantiation for Public Input

Version 2D of the FAA AC is anticipated to be published and current ahead of the publication and effective date for NFPA418-2023.

Locations exist outside the USA where reference is made to NFPA Standards as default or as guidance but are located in a non-FAA aeronautical regulatory environment. Relevance of NFPA provisions and use by AHJ in such locations is enhanced by acknowledgement that non-FAA Standards and Recommended Practices for heliports are in use.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 60-NFPA 418-2022 [Section No. 4.3.3]</u>	

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Public Input No. 60-NFPA 418-2022 [Section No. 4.3.3]

4.3.3

Aboveground flammable liquid storage tanks, compressed gas storage tanks, fuel storage tanks, and liquefied gas storage tanks shall be laterally located at least 50 ft (15.2 m) from the edge of the FATO area as defined in FAA AC 150/5390-2C 2D , *Heliport Design Advisory Circular*.

Statement of Problem and Substantiation for Public Input

Version -2D of the FAA AC is anticipated to be published an in effect before the publication and effective date of NFPA418-2023

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 59-NFPA 418-2022 [Section No. 4.2.2]</u>	Reference to version 2D of FAA AC

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Public Input No. 16-NFPA 418-2022 [New Section after 4.7]

4.8 Power Transfer and Charging Systems.

4.8.1 Power transfer and charging systems shall be installed in accordance with NFPA 70.

4.8.2 Power transfer and charging systems shall be designed to not penetrate the FATO and safety area obstruction clearance requirements in FAA AC 150/5390-2D, Helicopter Design Advisory Circular and FAA AC 150/5390-3(X), Vertiport Design Advisory Circular.

4.9 Electrical Hazard Protection

4.9.1 Where electric and hybrid electric aircraft are to be operated, landing area surfaces shall be designed to prevent electric shock hazards to ground personnel and passengers. (See Annex E for guidance)

4.9.2 All power transfer and charging systems shall have all of the following:

- (1) (1) an emergency shut-off button that will de-energize electrical power to the system**
- (2) (2) be located within 25 feet of the edge of a FATO or parking area respectively.**
- (3) (3) be fully accessible and clearly marked.**

Statement of Problem and Substantiation for Public Input

Power transfer and charging systems will be a key component for eVTOL aircraft and vertiports servicing them. This addition provides direction for the installation and safe operation of these units and systems.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 45-NFPA 418-2022 [New Section after D.3]</u>	

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Public Input No. 15-NFPA 418-2022 [Section No. 4.7]

4.7 Fueling System.

Fueling systems shall be designed in accordance with NFPA 407 or approved alternative energy source as permitted in 4.7.1.1 or 4.7.1.2.

4.7.1

Fueling equipment shall not hinder or obstruct access to exits or firefighting equipment.

4.7.1.1 Energy storage systems, including storage of lithium-ion batteries, shall be designed, and installed, in accordance with NFPA 855.

4.7.1.2 Hydrogen storage and fueling facilities shall be designed and installed in accordance with NFPA 2.

4.7.2

Fueling equipment shall be located a minimum of 25 ft (7.6 m) from hangars and fixed fire protection equipment.

4.7.3

Fuel servicing equipment shall be designed to not penetrate the FATO and safety area obstruction clearance requirements in FAA AC 150/5390-2C, *Heliport Design Advisory Circular*.

Statement of Problem and Substantiation for Public Input

Alternative energy sources for UAM and aircraft that will be serviced by vertiports include electric and hydrogen. These are significantly different than traditional liquid carbon based fuels. As such, these alternative energy sources have their own set of requirements. This revision guides the user and AHJ's to the appropriate documents.

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Public Input No. 17-NFPA 418-2022 [New Section after 5.4.2]

5.4.3 Rooftop landing area surfaces shall be designed to prevent electric shock hazards to ground personnel and passengers in accordance with NFPA 70E.

Statement of Problem and Substantiation for Public Input

This provides for life safety by directing the user to apply the requirements of NFPA 70E.

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Public Input No. 31-NFPA 418-2022 [New Section after 5.7]

5.8 Electrical Aircraft Battery Fire Protection

5.8.1 At site locations where electric aircraft are operated and batteries are recharged and/or stored, a dedicated water source with a minimum rate and duration shall be provided in accordance with NFPA 855.

5.8.2 Water source requirements outlined in 5.8.1 shall be available within 50 feet of each FATO and each parking position.

5.9 Hydrogen Vehicle and Fuel Cell Protection.

5.9.1 Hydrogen vehicle and fuel cell protection shall be in accordance with NFPA 2.

5.10 Energy/Fuel Type Considerations.

5.10.1 Sites that accommodate aircraft of different energy/fuel types shall provide the required fire protection for each energy/fuel type present.

Statement of Problem and Substantiation for Public Input

New and alternative powered aircraft will require alternative means and methods of fire protection. Traditional and/or water-based fire protection methods may not always be the best option for the protection of the aircraft, facility, or personnel. This change directs the user to the appropriate document for design for fire protection of these systems.

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Public Input No. 18-NFPA 418-2022 [Section No. 5.7.1 [Excluding any Sub-Sections]]

~~A foam~~ **At sites where aircraft containing liquid carbon-based fuels are intended to operate, a foam** fire-extinguishing system with either a fixed discharge outlet(s) in accordance with 5.7.2 or a hose line(s) in accordance with 5.7.3 shall be designed and installed to protect the rooftop landing pad, unless otherwise permitted by the following:

- (1) ~~A foam fire-extinguishing system shall not be required for heliports located~~ sites located on open parking structures or buildings that are not normally occupied.
- (2) ~~For H-1 heliports, two portable foam extinguishers, each having a rating of 20-A:160-B, shall be permitted to be used to satisfy the requirement of 5.7.1 .~~ A specific site-based fire risk assessment, in accordance with Chapter 4 of NFPA 409.
- (3) A performance-based design approach, in accordance with Chapter 5 of NFPA 409.

Statement of Problem and Substantiation for Public Input

New and alternative powered aircraft will require alternative means and methods of fire protection. Traditional and/or water-based fire protection methods may not always be the best option for the protection of the aircraft, facility, or personnel. This change provides for the application of a risk assessment or performance-based design approach to ensure that the most accurate fire protection equipment and plan is in place for the hazard.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 19-NFPA 418-2022 [New Section after 5.7.1.1]	

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Public Input No. 63-NFPA 418-2022 [Section No. 5.7.1 [Excluding any Sub-Sections]]

A ~~foam~~ fire-extinguishing system with either a fixed discharge outlet(s) in accordance with 5.7.2 or a hose line(s) in accordance with 5.7.3 shall be designed and installed to protect the rooftop landing pad, unless otherwise permitted by the following:

- (1) A ~~foam~~ fire-extinguishing system shall not be required for heliports located on open parking structures or buildings that are not normally occupied.
- (2) For H-1 heliports, two portable foam extinguishers, each having a ~~rating~~ UL rating of 20-A:160-B or equivalent , shall be permitted to be used to satisfy the requirement of 5.7.1.

Statement of Problem and Substantiation for Public Input

Clause amended to include all and any effective technologies for heliport/vertiport fire protection, and thereby not limited to a system and technology dispersing AFFF foam
Listing of rating for hand held extinguishers needs to identify the use of UL criteria in the nomination as other non-US jurisdictions have alternate national standards with similar but different ratings.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 51-NFPA 418-2022 [New Section after 1.3]</u>	system performance criteria to be nominated and respected

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Public Input No. 19-NFPA 418-2022 [New Section after 5.7.1.1]

5.7.1.1 At sites utilizing energy sources other than liquid carbon-based fuels, fire protection shall be provided in accordance with this standard and by one of the following:

- (1) **a specific site-based fire risk assessment, in accordance with chapter 4 of NFPA 409**
- (2) **a performance-based design approach, in accordance with chapter 5 NFPA 409**

Statement of Problem and Substantiation for Public Input

See substantiation for PI 18.

Alternate energy sources for new aircraft will required alternate fire protection solutions.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 18-NFPA 418-2022 [Section No. 5.7.1 [Excluding any Sub-Sections]]	

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Public Input No. 23-NFPA 418-2022 [Section No. 5.7.1.3]

5.7.1.3*

The foam discharge rate for the fire-extinguishing system shall be ~~0.10 gpm~~ 13gpm /ft² (~~4.5 L~~ 5lpm /min-m²) for aqueous film forming foam (AFFF) and Fluorine Free Foam, meeting performance standard level ICAO-B .

Statement of Problem and Substantiation for Public Input

ICAO Annex 14 and ICAO-9261 and CAP-437 and CAP-1264 and various other standard specify the discharge rate for the fixed fire extinguishing system to be 0.13gpm/ft² (5.5lpm/m²). Since section 5.7.2.5 is proposed to reduce the discharge duration for 5minutes from 10minutes, the discharge rate can be increased from 0.10gpm/ft² (4.1lpm/m²) to 0.13gpm/ft² (5.5lpm/m²). This will meet the other global standards used for fire fighting systems on heliports.

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Submittal Date: Tue Jan 04 10:56:33 EST 2022

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Public Input No. 65-NFPA 418-2022 [Section No. 5.7.1.3]

5.7.1.3*

The ~~foam~~ discharge rate for the fire-extinguishing system shall be 0, in accordance with the following.

5.7.1.3.1 not less than 0.10 gpm/ft² (4.1 L/min·m min·per m²) for aqueous film forming foam (AFFF) meeting UL162 or equivalent standards for low expansion foam ;

5.7.1.3.2 not less than 0.135 gpm/ft² (5.5 L/min·per m²) for an ICAO performance level B foam

5.7.1.3.3 not less than 1.092 gpm/ft² (3.75 L/min·per m²) for an ICAO performance level C foam and for water

5.7.1.3.4 or an alternate discharge rate as approved by the relevant authority having jurisdiction.

Statement of Problem and Substantiation for Public Input

Suggested text covers systems with a range of technologies including foam systems and a range of fire retardant media appropriate to the system in use and the relevant regulatory and AHJ

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 51-NFPA 418-2022 [New Section after 1.3]</u>	Alternate technologies and performance design criteria

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Public Input No. 24-NFPA 418-2022 [Section No. 5.7.1.5]

5.7.1.5

The ~~foam-~~ Foam and fire protection system components shall be installed in an area of the heliport and shall not penetrate, when not in use, the approach departure surface, transitional surfaces, TLOF, FATO, and safety areas as defined in FAA AC 150/5390-2G 2D , *Heliport Design Advisory Circular*.

Statement of Problem and Substantiation for Public Input

Prohibits other types for fire protection system components, not just foam, from penetrating hazard and safety areas.

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Public Input No. 66-NFPA 418-2022 [Section No. 5.7.1.5]

5.7.1.5

The ~~foam~~ fire extinguishing system components shall be installed in an area of the heliport and shall not penetrate, when not in use, the approach departure surface, transitional surfaces, TLOF, FATO, and safety areas as defined in FAA AC 150/5390-2G 2D , *Heliport Design Advisory Circular*.

Statement of Problem and Substantiation for Public Input

Provisions of Clause 5.7.1.5 apply to all system technologies not only foam-based systems. AC150/5390-2C strongly anticipated to be superseded by -2d before NFPA418-2023 is published and in effect.

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Public Input No. 70-NFPA 418-2022 [Section No. 5.7.2]

5.7.2 Fixed Foam- Fire-Extinguishing Systems.

5.7.2.1 –

Fixed foam fire-extinguishing systems shall be designed and installed in accordance with NFPA 11 or an equivalent standard, as appropriate, except as modified by this chapter.

5.7.2.2 * –

The design area of application of foam discharge for fixed discharge outlet systems shall be the entire rooftop landing pad.

5.7.2.3 –

The duration of foam discharge for the fixed discharge outlet system shall be 10 minutes.

5.7.2.4 –

A fixed nozzle discharge outlet system shall be one of the following: fixed stationary nozzles around the perimeter, two or more oscillating monitors/nozzles, or in-deck (deck-integrated firefighting system) nozzles within the perimeter of the deck.

5.7.2.5 –

Where fixed foam systems utilizing fixed deck nozzles or oscillating foam turrets, or both, are installed, system components shall be listed or approved.

5.7.2.6 – Activation of Systems.

5.7.2.6.1 * –

The fixed discharge outlet system shall be activated manually.

5.7.2.6.2 * –

Manual actuation stations shall be located at each egress point from the rooftop landing pad and at an approved location inside the building from which the rooftop landing pad can be viewed.

5.7.2.6.3 –

Manual foam activation stations shall be clearly labeled or identified as to the purpose and hazard protected.

5.7.2.6.4 –

Where buildings are provided with a fire alarm system, the activation of the foam system shall be monitored by the building fire alarm system in accordance with *NFPA 72*.

5.7.2.6.5 –

An approved manual control for foam system shutdown shall be accessible at all times, including the time of fire and system operation.

Statement of Problem and Substantiation for Public Input

The word 'foam' is removed from the section title. The provisions in section 5.7.2 apply to all fixed fire-extinguishing systems not only those based on foam.

Related Public Inputs for This Document

Related Input

Relationship

Public Input No. 51-NFPA 418-2022
[New Section after 1.3]

performance criteria and design objectives for all
fixed discharge systems

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Public Input No. 26-NFPA 418-2022 [Section No. 5.7.2.1]

5.7.2.1

~~Fixed~~ Where fixed foam fire-extinguishing systems ~~shall~~ are required, the system shall be designed and installed in accordance with NFPA 11 or an equivalent standard, as appropriate, except as modified by this chapter.

Statement of Problem and Substantiation for Public Input

Identifies that this applies only to areas where foam systems are required. This is to alleviate any misinterpretation that a fixed foam system is required.

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Public Input No. 71-NFPA 418-2022 [Section No. 5.7.2.1]

5.7.2.1

Fixed ~~foam~~ fire-extinguishing systems shall be designed and installed in accordance with NFPA 11 for systems using foam as the primary agent and NFPA 15 for systems using water as the primary agent or an equivalent standard, as appropriate, except as modified by this chapter.

Statement of Problem and Substantiation for Public Input

Amended wording for Clause 5.7.2.1 acknowledges alternate fire control media are available and presented in detail in associated NFPA standards with the provisions of 5.7.2.1 permitting amendments to the associated standards to best suit heliport and vertiport facilities.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 51-NFPA 418-2022 [New Section after 1.3]	Reference to Design Objectives and performance criteria for systems

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Public Input No. 72-NFPA 418-2022 [Section No. 5.7.2.2]

5.7.2.2*

The design area of application of ~~foam discharge~~ primary fire extinguishment media for fixed discharge outlet systems shall be the entire rooftop landing pad.

Statement of Problem and Substantiation for Public Input

Provisions of Clause 5.7.2.2 apply to fixed fire-extinguishing systems regardless of technology used and are not restricted to foam-based systems

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 51-NFPA 418-2022 [New Section after 1.3]	System performance to be related to Design Objectives

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Public Input No. 25-NFPA 418-2022 [Section No. 5.7.2.3]

5.7.2.3

The duration of foam discharge for the fixed discharge outlet system shall be 10 minutes. For In deck nozzle (DIFF) systems where the equipment's are listed or approved and full scale fire tested the discharge duration shall be reduced to 5 minutes)

Statement of Problem and Substantiation for Public Input

There are several industry standards / best practices which specifies the foam discharge duration of 5minutes for fixed foam systems. Example ICAO Annex 14 and ICAO-9261 and CAP-437 and CAP-1264 which cover land based installations and marine-offshore installations.

Foam monitor systems and Ring main systems (Nozzles installed on perimeter of heliport) are not tested in full scale fire scenario with various wind conditions or may not be listed and approved for full scale fire tests. Example a ring main nozzle may not be able to cover a deck size of 60ft. x 60ft. from nozzles installed outside the perimeter, since the spray from the nozzle will not reach the center of the deck or may require higher pressures and nozzle quantity.

Since there is no test data available for the full scale fire test with monitors and ring main nozzles the duration can be for 10minutes. For DIFF system or any alternate systems where the test data of full scale fire test is available then for such systems the duration can be reduced to 5 minutes.

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Public Input No. 73-NFPA 418-2022 [Section No. 5.7.2.3]

5.7.2.3

The duration of ~~foam~~ discharge for the fixed discharge outlet system shall be ~~10 minutes. no less than~~

5.7.2.3.1 five minutes for systems discharging foam where the foam meets UL162 or ICAO performance level B criteria

5.7.2.3.2 two minutes for systems designed to achieve full discharge within 15 seconds of activation and discharging foam meeting ICAO performance level C criteria and for water

5.7.2.3.3 duration criteria as nominated by the authority having jurisdiction.

Statement of Problem and Substantiation for Public Input

Amended provisions of 5.7.2.3 intended to acknowledge alternate system technologies, fire-extinguishing media and system design characteristics exist and are available to achieve Design Objectives where such are declared.

Length of design discharge duration for UL162 foam systems reduced from 10-minutes (418-2021) to the earlier criteria (418-2016) of 5-minutes as practical timing and equates with alternate standards organisations such as ICAO noting that establishing system discharge times to reflect response time of outside services for rooftop heliports and vertiports is impractical.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 51-NFPA 418-2022 [New Section after 1.3]</u>	System performance needs to be relate to Design Objectives

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Public Input No. 74-NFPA 418-2022 [Section No. 5.7.2.4]

5.7.2.4

A fixed nozzle discharge outlet system shall be one of the following: fixed stationary nozzles around the perimeter, two or more oscillating monitors/nozzles, or in-deck DIFFS (deck-integrated ~~firefighting~~ fire-fighting system) nozzles within the perimeter of the deck.

Statement of Problem and Substantiation for Public Input

revised text includes use of DIFFS acronym widely used for such systems. It is noted that the existing provisions of this clause as written apply to fire -extinguishing systems regardless of the technology and extinguishment media used.

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Public Input No. 27-NFPA 418-2022 [Section No. 5.7.2.5]

5.7.2.5

Where fixed foam systems utilizing fixed deck nozzles or oscillating foam turrets, or both, are installed, system components ~~shall be~~ and specified type of foam concentrates with which they are intended to be used are to be investigated for use with each other. Either listed or approved.

Statement of Problem and Substantiation for Public Input

Current standard does not specify in a complete foam system the foam concentrate is tested with storage, mixing, discharge devices for its performance when integrated as one system.

(Example: Based on the current standard one can install the foam bladder tank with ratio controller from FM approved manufacturer and the discharge nozzles and foam concentrate from UL Listed another manufacturer. This combination meets the requirement as per current NFPA standard, since the current standard states that the discharge device shall be listed or approved and does not provide other equipment information or investigated with other components when installed as complete system.

If the foam equipment are tested with foam concentrate then that will make sure the system performance is in accordance with the test standards such as UL-162 or FM-5130. Example the foam mixing device and discharge device will perform for the respective foam with proper mixing range specified in NFPA and the foam expansion and drainage times are within the acceptable limits.

Reference for these can be found in the FM-5130 Section 1.2.2 and 1.2.3 and UL-162 Section I, section 1.1

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Public Input No. 64-NFPA 418-2022 [Section No. 5.7.2.6.1]

5.7.2.6.1*

The fixed discharge outlet system shall be activated manually.

Fixed discharge outlet systems shall be arranged for automatic operation with supplementary manual tripping means provided.

5.7.2.6.1.1 Manual operation of the system shall be permitted where a system is isolated and attended by trained personnel at all times.

5.7.2.6.1.2 Systems shall be designed to accomplish at least one of the design objectives defined in Section x xx and in accordance with Sections xxx through xxx, as applicable.

5.7.2.6.1.3 Systems shall be permitted to have other design objectives requiring different protection where approved by the authority having jurisdiction.

Statement of Problem and Substantiation for Public Input

Nominated wording selected from Chapter 7 Design Objectives of NFPA15-2022. Automatic activation of system permitted (preferred) to align with other NFPA (2022) standards and in recognition that NFPA418-2021 Clause 5.7.1.1 acknowledges the existence of sites (hospital rooftop facilities) where trained personnel are not in attendance. Text includes cross reference to (missing) performance criteria and design objectives for NFPA418

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 51-NFPA 418-2022 [New Section after 1.3]</u>	Need for NFPA418 performance criteria highlighted

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Public Input No. 76-NFPA 418-2022 [Section No. 5.7.2.6.3]

5.7.2.6.3

Manual ~~foam~~ system activation stations shall be clearly labeled or identified as to the purpose and hazard protected.

Statement of Problem and Substantiation for Public Input

Provisions of 5.7.2.6.3 apply to all fixed discharge systems and are not limited to only foam-based systems

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Committee: HHH-AAA



Public Input No. 77-NFPA 418-2022 [Section No. 5.7.2.6.4]

5.7.2.6.4

Where buildings are provided with a fire alarm system, the activation of the ~~foam~~ fire-extinguishing system shall be monitored by the building fire alarm system in accordance with NFPA 72 NFPA 72 or equivalent .

Statement of Problem and Substantiation for Public Input

Provisions of 5.7.2.6.4 apply to all systems not only foam-based systems. System activation monitoring may require interfaces with local regulations and Building Management Systems (BMS) criteria that may be different to the provisions and criteria in NFPA 72.

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Public Input No. 78-NFPA 418-2022 [Section No. 5.7.2.6.5]

5.7.2.6.5

An approved manual control for ~~foam~~ fire-extinguishing system shutdown shall be accessible at all times, including the time of fire and system operation.

Statement of Problem and Substantiation for Public Input

Provisions of 5.7.2.6.5 apply to all systems not only foam-based systems

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Public Input No. 28-NFPA 418-2022 [New Section after 5.7.3]

5.7.4 Manual firefighting equipment for Electrical Aircraft (Reserved)

5.7.5 Manual firefighting equipment for Hydrogen Aircraft (Reserved)

Statement of Problem and Substantiation for Public Input

These sections will serve as a place holder for information specific to specialized manual firefighting equipment that may be required for these new technologies.

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Public Input No. 79-NFPA 418-2022 [Section No. 5.7.3.1]

5.7.3.1*

The area of application of foam discharge for hose line systems shall be the practical critical fire area for the category of the helicopter landing facility in accordance with Table 5.7.3.1.

Table 5.7.3.1 Practical Critical Fire Areas for Hose Line Systems Only

<u>Helicopter</u>	<u>Helicopter Overall</u>	<u>Practical Critical</u>	
		<u>Fire Area</u>	
<u>Category</u>	<u>Length* /D-Value</u>	<u>ft²</u>	<u>m²</u>
H-1	Less than 50 ft (15.2 m)	375	34.8
H-2	50 ft (15.2 m) up to but not including 80 ft (24.4 m)	840	78.0
H-3	80 ft (24.4 m) up to but not including 120 ft (36.6 m)	1440	133.8

*Helicopter length, including the tail boom and the rotors.

Statement of Problem and Substantiation for Public Input

Explanation of D-value as footnote to table not required if D-value is added to Section 3.3 - General Definitions

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 57-NFPA 418-2022 [New Section after 3.3.6]	D-value added as definition in Section 3.3 rather than table footnote
Public Input No. 89-NFPA 418-2022 [Section No. 9.2]	

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Public Input No. 29-NFPA 418-2022 [Section No. 5.7.6.2]

5.7.6.2

The foam concentrate for the fixed system or manual firefighting equipment shall be listed in accordance with UL 162, *Foam Equipment and Liquid Concentrates*, or FM 5130, *Approval Standard for Foam Extinguishing Systems*, and shall be on the qualified products list for MIL-F-24385, or equivalent. Non Fluorinated foam concentrate shall be listed or approved, in addition the foam concentrate shall meet the performance standard level ICAO-B as minimum .

Statement of Problem and Substantiation for Public Input

The Fluorine free foams are currently certified in accordance with UL-162 standard. The foam concentrates are also tested in accordance with ICAO-B requirement, it is not necessary that an UL Listed or FM approved foam concentrate will pass the ICAO-B fire test. Since global standards follow the ICAO-B and ICAO-C foam concentrate for the helideck / heliport protection it is recommended to add the foam concentrate shall meet ICAO-B requirement in addition to MIL spec. and UL or FM certification.

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Committee: HHH-AAA



Public Input No. 80-NFPA 418-2022 [Section No. 5.7.6.2]

5.7.6.2

The foam concentrate for the fixed system or manual firefighting equipment shall be listed in accordance with UL 162, *Foam Equipment and Liquid Concentrates*, or FM 5130, *Approval Standard for Foam Extinguishing Systems*, or meet ICAO performance level B or C criteria as appropriate and shall be on the qualified products list for MIL-F-24385, or equivalent.

Statement of Problem and Substantiation for Public Input

The provisions of 5.7.6.2 apply to all foam-based systems but the different performance and physical characteristic of each need to be acknowledged or an equivalency table included for comparison purposes (perhaps as an Appendix entry for information purposes)

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Public Input No. 82-NFPA 418-2022 [Section No. 5.7.8.2]

5.7.8.2 Manual Firefighting Equipment.

The hose hand-lines shall be flow tested to demonstrate that the design objectives as presented in Clause/Table xxx are met._

Statement of Problem and Substantiation for Public Input

Existing text in Clause 5.7.8.2 refers to "design objectives" Direct cross-reference to clauses or tables identifying the design objectives for a manual fire fighting system is required

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 51-NFPA 418-2022 [New Section after 1.3]</u>	Design Objectives for all systems required

Submitter Information Verification

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Public Input No. 84-NFPA 418-2022 [Section No. 5.7.9.1]

5.7.9.1

Fire protection systems installed in accordance with NFPA 11 or NFPA 14 or NFPA 15 shall be inspected, tested, and maintained in accordance with NFPA 25.

Statement of Problem and Substantiation for Public Input

Inclusion of NFPA 15 required to acknowledge use of water spray (passive deck with water-DIFFS) systems as an alternate technology

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Public Input No. 30-NFPA 418-2022 [New Section after 5.7.9.2]

5.7.9.3 Non-water-based fire protection systems shall be inspected, tested, and maintained in accordance with the standard they were installed to.

Statement of Problem and Substantiation for Public Input

This is to notify the user that any system, other than a water-based that is used for fire protection, must be inspected, tested, maintained accordingly, whether it is a clean agent, gaseous agent, dry- wet-chemical, or something new.

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Public Input No. 85-NFPA 418-2022 [Section No. 5.7.9.2]

5.7.9.2

Foam systems installed in accordance with NFPA 11 shall be maintained in accordance with NFPA 11 and NFPA 25 as appropriate . Water spray systems installed in accordance with NFPA 15 shall be maintained in accordance with NFPA 15 and NFPA 25 as appropriate.

Statement of Problem and Substantiation for Public Input

Amended text acknowledges the involvement of NFPA 25 and the standards in NFPA 15 for systems using passive decks and water DIFFS where relevant to a heliport/vertiport facility

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Public Input No. 33-NFPA 418-2022 [Section No. 6.2]

6.2 Rooftop Hangar Floor Drainage.

6.2.1

~~Floor~~ Where liquid carbon-based fuels are utilized, floor drainage systems shall be provided to restrict the spread of fuel in order to reduce fire and explosion hazards from fuel spillage.

6.2.2

Drainage systems shall use metallic pipe drained to a safe location, meeting one of the following criteria:

- (1) The system shall be designed with traps.
- (2) The system shall be provided with ventilation to prevent vapor mixtures from forming within the underground drainage system.

6.2.3

Drainage systems in ~~helicopter~~ aircraft storage and servicing areas shall be designed and constructed so that they have capacity to prevent buildup of flammable liquids and water over the drain inlet when fire protection systems and hose streams are discharging at the design rate.

6.2.4

The pitch of the rooftop hangar floor shall be a minimum of ½ of 1 percent.

6.2.5

The floor pitch provided shall be calculated taking into consideration the towing requirements, ~~helicopter~~ aircraft weight, maintenance, and so forth.

6.2.6

Curbs, ramps, or drains shall be provided at all openings from ~~helicopter~~ aircraft storage and servicing areas, or the slope of the floor shall be such as to prevent the flow of liquids through the openings.

6.2.7

Pits for service facilities, such as for compressed air and electrical outlets, shall drain into the floor drainage system.

6.2.8

Grates and drain covers shall be of sufficient strength to support the point loading of the heaviest type of helicopter or equipment that the rooftop hangar serves.

6.2.9

Grates and covers shall be removable to facilitate cleaning and flushing.

Statement of Problem and Substantiation for Public Input

Floor drainage systems should not be required where the hazard of liquid carbon-based fuel spills does not exist.

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Public Input No. 34-NFPA 418-2022 [Section No. 6.3]

6.3 Suspended or Elevated Heaters.

In ~~helicopter~~ the aircraft storage and servicing areas, listed electric, gas, or oil heaters shall be permitted and shall be installed at least 10 ft (3 m) ~~away from the helicopter engines~~ , vertically and horizontally, from all surfaces of the aircraft .

Statement of Problem and Substantiation for Public Input

Replaces 'helicopter' with 'aircraft' to identify that this applies to all aircraft types covered by this standard, not just helicopters. This also requires heaters to be 10ft from all aircraft surfaces. This is important as new aircraft types may be severely impacted by these heaters.

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Public Input No. 32-NFPA 418-2022 [Section No. 6.6]

6.6 Protection of ~~Helicopter~~- Rooftop Hangars.

6.6.1

~~Helicopter~~ Aircraft storage and servicing areas shall be protected in accordance with NFPA 409.

6.6.2

Foam concentrate shall be listed in accordance with UL 162, *Foam Equipment and Liquid Concentrates*, or FM 5130, *Approval Standard for Foam Extinguishing Systems*.

6.6.3

All other areas of the rooftop hangar shall be protected by water sprinkler systems designed, installed, and tested in accordance with NFPA 13.

Statement of Problem and Substantiation for Public Input

Replaces the word 'helicopter' with 'aircraft'. This is to identify that this requirement applies to other aircraft types covered in this standard, not just helicopters.

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Public Input No. 35-NFPA 418-2022 [New Section after 6.7]

Aircraft Maintenance.

Where aircraft maintenance is performed in a rooftop hangar it shall be conducted in accordance with NFPA 410 and the aircraft manufacturer's specifications.

Statement of Problem and Substantiation for Public Input

Brings in reference to NFPA 410 for aircraft maintenance. Also, provides direction to consult "manufacturers specifications" for maintenance and safety requirements.

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Committee: HHH-AAA



Public Input No. 36-NFPA 418-2022 [New Section after 7.1]

7.2 Calculation of Water Supply for Battery Fires. Where a water supply is provided for the rooftop landing pad area and rooftop hangar, the water supply shall be calculated on the demand for the largest system.

7.2.1 Where batteries are stored the water supply calculations shall be in accordance with section 4.11 of NFPA 855.

Statement of Problem and Substantiation for Public Input

Identifies and addresses specific water supply requirements for battery fires, and points to the guidance and requirements of NFPA 855.

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Public Input No. 86-NFPA 418-2022 [Section No. 7.1]

7.1* Calculation of Water Supply for Foam-fire-extinguishing Systems.

Where foam-fire-extinguishing systems are provided for the rooftop landing pad area and rooftop hangar, the water supply shall be calculated based on the demand for the largest system.

Statement of Problem and Substantiation for Public Input

Provisions of 7.1 are applicable to all systems not only those that are foam-based.

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Public Input No. 37-NFPA 418-2022 [Chapter 8 [Title Only]]

Offshore Heliports and Vertiports

Statement of Problem and Substantiation for Public Input

Identifies that this section also applies to offshore vertiports, and does not solely apply to offshore heliports.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 38-NFPA 418-2022 [Section No. 8.1]	
Public Input No. 39-NFPA 418-2022 [Section No. 8.2.1]	
Public Input No. 40-NFPA 418-2022 [Section No. 8.3]	

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Public Input No. 38-NFPA 418-2022 [Section No. 8.1]

8.1* Plans.

Plans for construction and protection of heliports and vertiports located on fixed and mobile offshore installations shall be approved by the AHJ.

Statement of Problem and Substantiation for Public Input

Identifies that this section applies to offshore vertiports, not solely offshore heliports.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 37-NFPA 418-2022 [Chapter 8 [Title Only]]	
Public Input No. 39-NFPA 418-2022 [Section No. 8.2.1]	
Public Input No. 40-NFPA 418-2022 [Section No. 8.3]	

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Public Input No. 39-NFPA 418-2022 [Section No. 8.2.1]

8.2.1

~~The heliport-~~ All heliports and vertiports shall have at least one access point for fire-fighting/rescue personnel.

Statement of Problem and Substantiation for Public Input

Identifies that this section applies to offshore vertiports, not solely offshore heliports.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 37-NFPA 418-2022 [Chapter 8 [Title Only]]</u>	
<u>Public Input No. 38-NFPA 418-2022 [Section No. 8.1]</u>	
<u>Public Input No. 40-NFPA 418-2022 [Section No. 8.3]</u>	

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Public Input No. 40-NFPA 418-2022 [Section No. 8.3]

8.3 Landing Pad Pitch.

Heliports and vertiports shall be designed to prevent the standing collection of liquids and to prevent liquids from spreading to or spilling onto accommodation spaces or working spaces.

Statement of Problem and Substantiation for Public Input

Identifies that this section applies to offshore vertiports, not solely offshore heliports.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 37-NFPA 418-2022 [Chapter 8 [Title Only]]	
Public Input No. 38-NFPA 418-2022 [Section No. 8.1]	
Public Input No. 39-NFPA 418-2022 [Section No. 8.2.1]	

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Public Input No. 94-NFPA 418-2022 [Chapter 9]

Chapter 9 Portable Fire Extinguishers

9.1 General.

The selection, installation, and maintenance of portable fire extinguishers shall comply with NFPA 10.

9.2 Minimum Requirement.

At least one portable fire extinguisher as specified in Table 9.2 shall be provided for each takeoff and landing area, parking area, and fuel storage area.

Table 9.2 Minimum Ratings of Portable Fire Extinguishers for Heliport Categories

<u>Heliport</u>	<u>Helicopter Overall</u>	<u>Minimum</u>
<u>Category</u>	<u>Length/D-value*</u>	<u>Rating (UL)</u>
H-1	Less than 50 ft (15.2 m)	4-A:80-B
H-2	50 ft (15.2 m) up to but not including 80 ft (24.4 m)	10-A:120-B
H-3	80 ft (24.4 m) up to but not including 120 ft (36.6 m)	30-A:240-B

*Helicopter length, including the tail boom and the rotors.

9.3 Extinguishers Subject to Damage, Theft, or Tampering.

Where the portable extinguisher cannot be maintained and safeguarded against damage, theft, or tampering, the portable fire extinguisher shall be omitted with the approval of the AHJ.

9.4 Travel Distance, as defined by NFPA-10, shall be measured from the edge of the FATO.

9.5 Wheeled fire extinguishers shall be considered for hazard protection in areas in which a fire risk assessment has shown the following:

- (1) High hazard areas are present
- (2) Limited available personnel are present, thereby requiring an extinguisher that has the following features
 - (3) High agent flow rate
 - (4) Increased agent stream range
 - (5) Increased agent capacity

*Note: Consideration for wheeled fire extinguishers should be given at locations where helicopters are routinely based.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
5a_Heliport_Fire_Extinguisher_Basics.pdf	Heliport Fire Extinguisher Basics	

Statement of Problem and Substantiation for Public Input

Travel Distance: While NFPA-10 speaks to what the acceptable travel distance is for a specific fire extinguisher type, neither NFPA-10 or NFPA-418 specify where that measurement should be taken at

a heliport. If the measurement is taken from the center of the FATO and the distance is 30 or 50 feet respectively, then the fire extinguisher in question would most likely constitute a hazard as it will be located inside the FATO or Safety Area. Providing a starting point is important to being able to assess the effectiveness of fire extinguisher placement.

Recommendation for Wheeled Fire Extinguishers: In the helicopter accident that occurred in Frisco, Colorado July 3, 2015, NTSB Report No. CEN15FA290, a situation occurred where during the response to a helicopter accident in the vicinity of a hospital heliport where the accident aircraft was both based and hangared, the ensuing post crash fire was of such magnitude from the AS-350 B3 helicopter that five (5) 30 lb. portable fire extinguishers were used in failed attempt to rescue one of the trapped helicopter crew members from the aircraft wreckage. It was not until a larger wheeled fire extinguisher was used were the responders successful in cutting a path to the trapped crew member and performing a subsequent rescue. While it may be overly burdensome to require all heliports to have a wheeled fire extinguisher it may be prudent to include a recommendation that those sites where a helicopter is physically based consider having a wheeled fire extinguisher.

This also speaks to the slight ambiguity between NFPA-10 and NFPA-418 on size requirements based on the definition of "Extra Hazard" as stipulated in NFPA-10, 5.4.1.3 that states "Extra hazard occupancies shall be classified as locations where the quantity and combustibility of Class A combustible material are high or where high amounts of Class B flammables are present and rapidly developing fires with high rates of heat release are expected. These occupancies consist of fire hazards involved with the storage, packaging, handling, or manufacture of Class A combustibles, and/or the total quantity of Class B flammables expected to be present is more than 5 gal (18.9 L) in any room or area." Additionally NFPA-10 defines the appreciable depth of a flammable liquid in section 3.3.17 in the following way: "Flammable Liquids of Appreciable Depth. Flammable liquids of appreciable depth are those with a depth greater than 1/4 in. (6.3 mm)." In the case of the Frisco helicopter accident the amount of fuel in question was greater than the aforementioned 5 gallons and the appreciable depth was greater than the aforementioned 1/4 in. However, NFPA-418 only required one 30 lb. fire extinguisher to be onsite at the heliport as a minimum.

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Public Input No. 41-NFPA 418-2022 [Section No. 9.2]

9.2 Minimum Requirement.

At least one portable fire extinguisher as specified in Table 9.2 shall be provided for each takeoff and landing area, parking area, and fuel storage area or charging site .

Table 9.2 Minimum Ratings of Portable Fire Extinguishers for Heliport Categories

<u>Heliport- Aircraft</u>	<u>Overall</u>	<u>Minimum</u>
<u>Category</u> <u>Helicopter</u>	<u>Length/D-value*</u> <u>Length or Controlling Dimension</u>	<u>Rating (UL)</u>
H-1	Less than 50 ft (15.2 m)	4-A:80-B <u>TBD</u>
H-2	50 ft (15.2 m) up to but not including 80 ft (24.4 m)	10-A:120-B <u>TBD</u>
H-3	80 ft (24.4 m) up to but not including 120 ft (36.6 m)	30-A:240-B <u>TBD</u>

*Helicopter length, including the tail boom and the rotors.

Statement of Problem and Substantiation for Public Input

Adds the requirement for portable fire extinguishers at charging sites.

Identifies that this section applies to all aircraft types referenced by this standard, not just helicopters.

Adds the term 'controlling dimension' for alternatively shaped aircraft.

Besides the potential for Lithium-Ion batteries and Hydrogen fuel or fuel cells, much of the materials to be used in in the construction of eVTOL aircraft will include aluminum, composites, molded plastics, and fiberglass. Minimum ratings need to be reconsidered as they may not be accurate for the hazard.

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Public Input No. 89-NFPA 418-2022 [Section No. 9.2]

9.2 Minimum Requirement.

At least one portable fire extinguisher as specified in Table 9.2 shall be provided for each takeoff and landing area, parking area, and fuel storage area.

Table 9.2 Minimum Ratings of Portable Fire Extinguishers for Heliport Categories

<u>Heliport</u>	<u>Helicopter Overall</u>	<u>Minimum</u>
<u>Category</u>	<u>Length/D-value*</u>	<u>Rating (UL)</u>
H-1	Less than 50 ft (15.2 m)	4-A:80-B
H-2	50 ft (15.2 m) up to but not including 80 ft (24.4 m)	10-A:120-B
H-3	80 ft (24.4 m) up to but not including 120 ft (36.6 m)	30-A:240-B

*Helicopter length, including the tail boom and the rotors.

Statement of Problem and Substantiation for Public Input

Inclusion of D-value in Section 3.3 - General definitions will remove need for reference to D-value as a table footnote

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 79-NFPA 418-2022 [Section No. 5.7.3.1]	Addition of D-value in definitions removes need for table footnote
Public Input No. 57-NFPA 418-2022 [New Section after 3.3.6]	Addition of D-value in definitions removes need for table footnote

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Public Input No. 90-NFPA 418-2022 [Section No. 10.1]

10.1 Emergency Response Plan.

An approved emergency response plan shall be developed for each heliport or vertiport .

Statement of Problem and Substantiation for Public Input

Additional text ensures application of standard to VTOL and eVTOL facilities.

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Public Input No. 91-NFPA 418-2022 [Section No. 10.2]

10.2 Training.

Annual training for the emergency response plan shall be conducted for facility personnel involved with heliport or vertiport emergency operations. *(See Annex B for guidance on training of facility personnel.)*

Statement of Problem and Substantiation for Public Input

Additional text ensures standard applies to both heliports and vertiports

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Public Input No. 42-NFPA 418-2022 [Chapter 11]

Chapter 11 – Vertiports and Vertistops (Reserved)

11.1 * – General. (Reserved)

11.2 – Electric Storage Systems. (Reserved)

11.3 – Charging Stations. (Reserved)

11.4 – Emergency Electrical Shutoff System. (Reserved)

11.5 – Electrical Testing. (Reserved)

11.6 – Aircraft Batteries. (Reserved)

11.7 – Battery Storage Facilities. (Reserved)

11.8 – Electrical Safety. (Reserved)

11.9 – Battery Fire Containment. (Reserved)

11.10 – Hybrid/Electric Aircraft. (Reserved)

11.11 – Hydrogen Fuel Cells. (Reserved)

11.12 – Hydrogen Fueling. (Reserved)

11.13 – Fire Protection. (Reserved)

11.14 – Firefighting Equipment. (Reserved)

11.15 – Portable Fire Extinguishers. (Reserved)

11.16 – Mixed Case Power/Fuel. (Reserved)

11.17 – Other Considerations. (Reserved)

Statement of Problem and Substantiation for Public Input

Recommend removal of this chapter. This was used as a place holder from the previous code cycle. It was decided by the task group to add information pertaining to vertiports throughout the existing sections of NFPA 418, rather than as its own chapter.

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Public Input No. 92-NFPA 418-2022 [Section No. A.3.3.3]

A 3 . 3 . 3 _ Fire-Extinguishing Systems.

A3. 3.3 – .1 _ Foam Fire-Extinguishing System Systems .

A foam fire-extinguishing system can be a fixed discharge outlet system utilizing fixed storage and piping connected to fixed outlets or monitor nozzles and manually activated by pushing a button on a console or a pull station. It also can be a hose line system connected to fixed storage.

A3.3.3.2 _ Water Spray Fire-extinguishing Systems

A heliport or vertiport facility incorporating an aluminum load bearing surface with demonstrated passive fire extinguishing capabilities used in tandem with a matrix of in-deck DIFFS nozzles discharging water as the primary extinguishing agent in a dispersed pattern. Such systems consist of a perforated upper surface connecting with an internal drainage path to rapidly remove spilt fluids and a minimum time of less than 15 seconds between activation and full discharge of the system.

Statement of Problem and Substantiation for Public Input

NFPA 418 stakeholders need to be aware that alternatives to foam-based systems may be available where such alternative systems meet Design Objectives. Text describes the essential features of a passive deck with water-DIFFS.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 50-NFPA 418-2022 [Section No. 1.3.1]</u>	Acknowledgment of New Technology options
<u>Public Input No. 51-NFPA 418-2022 [New Section after 1.3]</u>	Relates to the need for system Design Objectives

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Submission Date: Wed Jan 05 09:09:27 EST 2022
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Public Input No. 95-NFPA 418-2022 [Section No. A.4.1.1]

A.4.1.1

A foam system consists of a water supply, a foam concentrate supply, proportioning equipment, a piping system, foam makers, and discharge devices designed to distribute foam effectively over the hazard. Some systems include detection devices.

A water-based system consists of a passive aluminum deck used in tandem with a water supply and piping system connecting through a deluge valve and associated controls to supply a network of in-deck DIFFS nozzles. Such systems are activated automatically with supplementary manual activation available.

Statement of Problem and Substantiation for Public Input

Additional text describes the elements of a water-based fire extinguishing system that need to be considered to ensure compliance with the requirements of the Clause 4.1.1 is achieved.

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Public Input No. 96-NFPA 418-2022 [Section No. A.4.2]

A.4.2

FAA AC 150/5390-2G 2D , *Heliport Design Advisory Circular, or equivalent,* contains design and construction information on heliports. This advisory circular provides for adequate clearance between operating aircraft and buildings or structures located at the heliport. The FAA advisory circular or equivalents where alternative regulatory provisions apply, should be consulted to ensure that adequate safe practice and facilities are maintained.

Statement of Problem and Substantiation for Public Input

Amended text acknowledges that non-FAA regulatory provisions may exist in locations where reference to NFPA418 standards and guidance is applied.

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Public Input No. 99-NFPA 418-2022 [New Section after A.5.2]

A.5.1

The SFPE Engineering Guide, Fire Safety for Very Tall Buildings (2022), provides design guidance related to rooftop landing facilities in very tall buildings.

Statement of Problem and Substantiation for Public Input

The SFPE Engineering Guide, Fire Safety for Very Tall Buildings provides additional information for the engineer who is involved with the design of rooftop landing facilities on very tall buildings. It includes information related to egress, fire department activities, and fire protection systems.

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Public Input No. 97-NFPA 418-2022 [Section No. A.5.2]

A.5.2

Where the landing pad is nonporous, fuel-tight, and provided with a proper drainage system, and where fuel cannot flow to support members, the main structural support members would not need to be fire rated. It is noted that while the upper surface of aluminum helipads with a passive fire-extinguishing capability is not solid, the components creating the upper surface form an internal drainage system with the resultant helipad platform being nonporous and fuel tight with reference to the surrounding structural support members.

Statement of Problem and Substantiation for Public Input

Additional text is added to A 5.2 to clarify the potential anomaly between a passive deck that actively drains fluid and a requirements under Clause 5.2 for the deck to be nonporous.

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Public Input No. 62-NFPA 418-2022 [Section No. A.5.4.1.1(1)]

A.5.4.1.1(1)

Examples of such materials include steel, concrete, masonry, glass, and ~~some~~ aluminum alloys meeting the EN-AW-6XXX/5XXX series grade r equivalent .

Statement of Problem and Substantiation for Public Input

Listing of specific series of suitable aluminium alloys more definitive and helpful than the less prescriptive "some" descriptor. it is also noted that the other identified materials ae listed without further qualification.

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Public Input No. 43-NFPA 418-2022 [Chapter D]

Annex D Informational References

D.1 Referenced Publications.

The documents or portions thereof listed in this annex are referenced within the informational sections of this standard and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

D.1.1 NFPA Publications.- (Reserved)

NFPA 2, Hydrogen Technologies Code, 2020 edition.

NFPA 855, Standard for the Installation of Stationary Energy Storage Systems, 2020 edition.

D.1.2 Other Publications.

D.1.2.1 FAA Publications.

Federal Aviation Administration, US Department of Transportation, 1200 New Jersey Avenue, SE, Washington, DC 20590.

FAA AC 150/5390-2C, *Helicopter Design Advisory Circular*, April 24, 2012.

D.1.2.2 ICAO Publications.

International Civil Aviation Organization, 999 Robert-Bourassa Boulevard, Montréal, Québec H3C 5H7 Canada.

“Rescue and Firefighting Panel, Report of the Second Meeting,” Document 9036 RFFP II, Montreal, June 5–16, 1972.

D.2 Informational References. (Reserved)

D.3 References for Extracts in Informational Sections.- (Reserved)

~~NFPA 2, Hydrogen Technologies Code, 2020 edition.~~

~~NFPA 55, Compressed Gases and Cryogenic Fluids Code, 2020 edition.~~

~~NFPA 400, Hazardous Materials Code, 2022 edition.~~

~~NFPA 855, Standard for the Installation of Stationary Energy Storage Systems, 2020 edition.~~

Statement of Problem and Substantiation for Public Input

Adds new informational references.

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Public Input No. 45-NFPA 418-2022 [New Section after D.3]

Annex E. Electric Aircraft Safety Precautions for Heliports and Vertiports

[see attached]

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
418_AnnexE.docx	Annex E content	

Statement of Problem and Substantiation for Public Input

This annex provides guidance for safety and emergency planning and training for facilities utilizing ESS technologies. Much of the information is direct reference from NFPA 855.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 16-NFPA 418-2022 [New Section after 4.7]</u>	This code section refers to this annex for guidance.

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Public Input No. 46-NFPA 418-2022 [New Section after D.3]

Annex F Hydrogen Aircraft Safety Precautions for Heliports and Vertiports

[see attached]

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
418_AnnexF.docx	Annex F content	

Statement of Problem and Substantiation for Public Input

This annex provides guidance for safety and emergency planning and training for facilities utilizing hydrogen technologies. Much of the information is direct reference from NFPA 2.

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