Second Revision No. 64-NFPA 1700-2019 [Detail]

10.5.5 Interior Fire Control.

Submitter Information Verification

Committee:

Submittal Date: Mon Apr 01 14:26:50 EDT 2019

Committee Statement

Committee Statement: Change Section heading from "Direct Fire Attack" to "Direct Fire Control." Fire control is defined.

Response Message: SR-64-NFPA 1700-2019

Second Revision No. 11-NFPA 1700-2019 [Section No. 1.1]

1.1 Scope.

This guide addresses structural fire-fighting strategy~~, tactics,~~ and ~~tasks~~ tactics as supported by science-based research.

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Wed Mar 20 15:40:15 EDT 2019

Committee Statement

Committee Statement: Proposed guideline does not break down into task level details.
Response Message: SR-11-NFPA 1700-2019

Public Comment No. 19-NFPA 1700-2018 [Section No. 1.1]

Second Revision No. 12-NFPA 1700-2019 [Section No. 1.2]

1.2 Purpose.

The purpose of this document is to provide guidance for the development of policies, procedures, and guidelines, including strategies~~, tactics,~~ and ~~tasks~~ tactics for structural firefighting supported by science-based research.

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Wed Mar 20 15:43:29 EDT 2019

Committee Statement

Committee Statement: Task level elements are not addressed in the guideline.
Response Message: SR-12-NFPA 1700-2019

Public Comment No. 20-NFPA 1700-2018 [Sections 1.2, 1.3]

Second Revision No. 13-NFPA 1700-2019 [Section No. 1.3]

1.3 Application.

The intent of this guide is to provide guidance on the application of science-based fire dynamics research supporting fire-fighting practices recognizing that life safety of the public and the first responder is the highest incident priority, followed by incident stabilization and property conservation .

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Wed Mar 20 15:44:33 EDT 2019

Committee Statement

Committee Statement: incident stabilization and property conservation are added in application.
Response Message: SR-13-NFPA 1700-2019

Second Revision No. 77-NFPA 1700-2019 [Section No. 2.4]

2.4 References for Extracts in ~~Mandatory~~ Advisory Sections.

NFPA 13, *Standard for the Installation of Sprinkler Systems,* 2019 edition.

NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances,* 2019 edition.

NFPA 30, *Flammable and Combustible Liquids Code,* 2018 edition.

NFPA 53, *Recommended Practice on Materials, Equipment, and Systems Used in Oxygen-Enriched Atmospheres,* 2016 edition.

NFPA 54, *National Fuel Gas Code,* 2018 edition.

NFPA 55, *Compressed Gases and Cryogenic Fluids Code,* ~~2016~~ 2020 edition.

NFPA 68, *Standard on Explosion Protection by Deflagration Venting,* 2018 edition.

NFPA 70®, *National Electrical Code®,* ~~2017~~ 2020 edition.

NFPA 72®, *National Fire Alarm and Signaling Code®,* 2019 edition.

NFPA 92, *Standard for Smoke Control Systems,* 2018 edition.

NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations,* 2017 edition.

NFPA *101®*, *Life Safety Code®,* 2018 edition.

NFPA 115, *Standard for Laser Fire Protection,* ~~2016~~ 2020 edition.

NFPA 400, *Hazardous Materials Code,* ~~2016~~ 2019 edition.

NFPA 402, *Guide for Aircraft Rescue and Fire-Fighting Operations,* ~~2013~~ 2019 edition.

NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents,* 2018 edition.

NFPA 475, *Recommended Practice for Organizing, Managing, and Sustaining a Hazardous Materials/Weapons of Mass Destruction Response Program,* 2017 edition.

NFPA 610, *Guide for the Emergency and Safety Operations at Motorsports Venues,* 2019 edition.

NFPA 654, *Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids,* ~~2017~~ 2020 edition.

NFPA 901, *Standard Classifications for Incident Reporting and Fire Protection Data,* 2016 edition.

NFPA 921 *Guide for Fire and Explosion Investigations,* 2017 edition.

NFPA 1006, *Standard for Technical Rescue Personnel Professional Qualifications,* 2017 edition.

NFPA 1026, *Standard for Incident Management Personnel Professional Qualifications,* 2018 edition.

NFPA 1405, *Guide for Land-Based Fire Departments That Respond to Marine Vessel Fires,* ~~2016~~ 2020 edition.

NFPA 1410, *Standard on Training for Emergency Scene Operations,* 2015 edition.

NFPA 1620, *Standard for Pre-Incident Planning,* 2020 edition.

NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents,* 2017 edition.

NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments,* ~~2016~~ 2020 edition.

NFPA 1851, *Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting,* ~~2019~~ 2020 edition.

NFPA 1901, *Standard for Automotive Fire Apparatus,* 2016 edition.

NFPA 1963, *Standard for Fire Hose Connections,* 2019 edition.

NFPA 1964, *Standard for Spray Nozzles and Appliances* , 2018 edition.

NFPA 1977, *Standard on Protective Clothing and Equipment for Wildland Fire Fighting,* 2016 edition.

NFPA 5000®, *Building Construction and Safety Code®,* 2018 edition.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Apr 02 08:50:50 EDT 2019

Committee Statement

Committee Statement: NFPA 1620 added for extracted definition of Abandoned Building.

Response Message: SR-77-NFPA 1700-2019

Second Revision No. 85-NFPA 1700-2019 [Section No. 3.3.16]

3.3.16 ~~Carcinogens~~ Carcinogen/Carcinogenic .

A cancer-causing substance that is identified in one of several published lists, including, but not limited to, those prepared by the U.S. National Toxicology Program, the International Agency for Research on Cancer (IARC), the National Institute for Occupational Safety and Health (NIOSH), and the American Conference of Governmental Industrial Hygienists (ACGIH). [**1851,**~~2019~~ 2020]

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Tue Apr 23 14:19:09 EDT 2019

Committee Statement

Committee Statement: Definition updated to match proposed update to the 2020 edition of NFPA 1851
Response Message: SR-85-NFPA 1700-2019

Second Revision No. 26-NFPA 1700-2019 [New Section after 3.3.33]

3.3.34 Decay Stage.

The stage of fire development within a structure characterized by either a decrease in the fuel load or available oxygen to support combustion, resulting in lower temperatures and lower pressure in the fire area. [**1410,** 2020]

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Fri Mar 22 11:45:08 EDT 2019

Committee Statement

Committee Statement: Definition of decay stage added to support the concepts presented in Chapter 5 related to fire growth.

Response Message: SR-26-NFPA 1700-2019

Second Revision No. 19-NFPA 1700-2019 [Section No. 3.3.35]

3.3.36 Defensive Strategy.

The plan for the actions or movements ~~of the arriving fire~~ of fire department units to protect exposures and ~~control~~ contain the main body of fire ~~with the intent~~ to ~~not enter the fire building~~ the already affected areas .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Fri Mar 22 10:14:42 EDT 2019

Committee Statement

Committee Statement: The TC removed "the arriving," whereas strategy is not solely an initial plan for "arriving units". Strategy can change late in the incident after all units have arrived. Saying strategy is for arriving units is just confusing. In addition "control" is replaced with "contain", and "with the intent to not enter the fire building" is removed.

Defensive strategies are not limited to exterior operations. You can implement a defensive strategy to protect interior exposures. Tactics such as shelter in place or trench cuts (with hose lines on the top floor under the trench cuts) are interior defensive tactics to fulfill a defensive strategy.

Add "contain the main body of fire to the already affected areas"

This is the true essence of what a defensive strategy is. We are writing off buildings or portions of the building that we cannot save and focusing our efforts to protect interior or exterior exposures.

Response Message: SR-19-NFPA 1700-2019

Public Comment No. 22-NFPA 1700-2018 [Section No. 3.3.35]

Second Revision No. 80-NFPA 1700-2019 [Section No. 3.3.50]

3.3.51* Energy Storage Systems (ESS) .

One or more components assembled together capable of storing energy ~~for use at a future time. ESS(s) can include but is not limited to batteries, capacitors, and kinetic energy devices (e.g., fly wheels and compressed air). These systems can have ac or dc output for utilization and can include inverters and converters to change stored energy into electrical energy~~ and providing electrical energy into the premises wiring system or an electric power production and distribution network . [**70:**706.2]

A.3.3.51 Energy Storage System (ESS).

ESS(s) can include but is not limited to batteries, capacitors, and kinetic energy devices (e.g., fly wheels and compressed air). These systems can have ac or dc output for utilization and can include inverters and converters to change stored energy into electrical energy.

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Tue Apr 23 13:11:00 EDT 2019

Committee Statement

Committee Statement: Explanatory notes for definition extracted from NFPA 70 placed s an annex item.
Response Message: SR-80-NFPA 1700-2019

Second Revision No. 20-NFPA 1700-2019 [New Section after 3.3.56]

3.3.58 Exposure—Personnel.

The process by which people, animals, and equipment are subjected to or come in contact with a hazardous environment or material.

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Fri Mar 22 10:38:20 EDT 2019

Committee Statement

Committee Statement: Definition added to support chapter 11 concepts
Response Message: SR-20-NFPA 1700-2019

Public Comment No. 66-NFPA 1700-2018 [Section No. 3.3.57]

Second Revision No. 21-NFPA 1700-2019 [Section No. 3.3.57]

3.3.59 Exposure—Structure .

The side of a structural assembly or separate part of the fireground that is directly exposed to the fire to which the fire could spread.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Fri Mar 22 11:09:46 EDT 2019

Committee Statement

Committee Statement: Clarification added for exposure related fire exposure versus new definition added for exposure to contaminants.

Response Message: SR-21-NFPA 1700-2019

Second Revision No. 22-NFPA 1700-2019 [Section No. 3.3.83]

3.3.85* Flow Path.

The ~~movement of heat and smoke from the higher pressure within the fire area towards the lower pressure areas accessible via doors, window openings, and roof structures~~ route followed by smoke, air, heat, or flame toward or away from an opening; typically, a window, door, or other leakage points, due to differences in pressure . [~~**1410,** 2015~~]

A.3.3.85 Flow Path.

The following list details the types of flows in a flow path, how they are generated, and related characteristics:

(1) The flow is caused by pressure differences that result from temperature differences, buoyancy, expansion, wind impact, and HVAC systems.

(2) Flow characteristics include stratification within the boundaries of a compartment or at an opening, the degree of turbulence and its direction, velocity, and shape. These characteristics can often be identified by evaluating the smoke/air flows.

(3) At openings or within rooms, hallways, stairways, and shafts, the smoke/air flows may be classified as unidirectional, bidirectional, or dynamic.

(4) Multiple flow paths are possible within a structure fire, and there may be multiple combinations of inlets and/or outlets.

(5) Flow paths can be altered by firefighting tactics.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Fri Mar 22 11:13:51 EDT 2019

Committee Statement

Committee Statement: The technical committee refined the definition for flow path and added clarification in an annex section.

Response Message: SR-22-NFPA 1700-2019

Public Comment No. 123-NFPA 1700-2018 [Section No. 3.3.83]

Second Revision No. 23-NFPA 1700-2019 [Section No. 3.3.91]

3.3.93 Fully Developed Stage.

The stage of fire development where heat release rate has reached its peak within a compartment based on available fuel or ventilation . [~~**1410,**~~ ~~2015~~]

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Fri Mar 22 11:22:02 EDT 2019

Committee Statement

Committee Statement: Definition modified for fully developed stage to correspond with other new definitions related to fire growth.

Response Message: SR-23-NFPA 1700-2019

Second Revision No. 24-NFPA 1700-2019 [New Section after 3.3.94]

3.3.97 Growth Stage.

The stage of fire development where the heat release rate from an incipient fire has increased to the point where heat transferred from the fire and the combustion products are pyrolyzing adjacent fuel sources and the fire begins to spread across the ceiling of the fire compartment (rollover). [**1410,** 2020]

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Fri Mar 22 11:25:47 EDT 2019

Committee Statement

Committee Statement: Definition for the growth stage of fire progression in a compartment.
Response Message: SR-24-NFPA 1700-2019

Second Revision No. 32-NFPA 1700-2019 [Section No. 3.3.106]

3.3.109 Horizontal Ventilation.

A method of utilizing natural ventilation currents to manage the flow of heat and smoke from the interior to the exterior while entraining fresh air from an intake on the same level of the structure.

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Fri Mar 22 14:16:00 EDT 2019

Committee Statement

Committee Statement: definition clarified for use in the guideline.
Response Message: SR-32-NFPA 1700-2019

Second Revision No. 25-NFPA 1700-2019 [New Section after 3.3.120]

3.3.124 Incipient Stage.

The early stage of fire development where the fire's progression is limited to a fuel source and the thermal hazard is localized to the area of the burning material. [**1410,** 2020]

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Fri Mar 22 11:39:20 EDT 2019

Committee Statement

Committee Statement: Definition of Incipient stage added to support the concepts presented in Chapter 5.
Response Message: SR-25-NFPA 1700-2019

Second Revision No. 29-NFPA 1700-2019 [Section No. 3.3.125]

~~**3.3.130***~~ ~~Kilowatt.~~

~~A measurement of energy release rate.~~ [~~**921,** 2017~~]

~~**A.3.3.125**~~ ~~Kilowatt.~~

~~A kilowatt is 1000 watts. A watt is a joule/second.~~

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Fri Mar 22 13:19:12 EDT 2019

Committee Statement

Committee Statement: definition deleted and replaced with the definition of watt with accompanying annex note on what a kilowatt is.
Response Message: SR-29-NFPA 1700-2019

Second Revision No. 27-NFPA 1700-2019 [Section No. 3.3.131]

3.3.134* Lightweight Construction.

Structures that have framework made out of wood or other lightweight materials.

A.3.3.134 Lightweight Construction.

Lightweight construction can include, but is not limited to, the following:

(1) Lightweight wood structural members such as engineered-type trusses, laminated beams, oriented strand board (OSB), or other such products that are attached with lightweight nail plates or glued and pressed in place

(2) Lightweight metal structural members of light gauge metal in the form of bar trusses and other such materials

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Fri Mar 22 13:06:44 EDT 2019

Committee Statement

Committee Statement: Annex note added to definition.

Response Message: SR-27-NFPA 1700-2019

Public Comment No. 53-NFPA 1700-2018 [Section No. 3.3.131]

Second Revision No. 81-NFPA 1700-2019 [Section No. 3.3.154]

~~**3.3.158** Photovoltaic Power Source.~~

~~An array or aggregate of arrays that generates dc power at system voltage and current. [**70:** 690.2]~~

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Tue Apr 23 13:36:00 EDT 2019

Committee Statement

Committee Statement: Definition not used in the guideline.
Response Message: SR-81-NFPA 1700-2019

Second Revision No. 82-NFPA 1700-2019 [Section No. 3.3.155]

3.3.157 Photovoltaic (PV) System.

The total components~~and subsystem~~ , circuits, and equipment up to and including the PV system disconnecting means that, in combination, convert solar energy into electric energy ~~for connection to a utilization load~~ . [**70:**100]

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Tue Apr 23 13:37:00 EDT 2019

Committee Statement

Committee Statement: Definition updated to referenced edition on NFPA 70
Response Message: SR-82-NFPA 1700-2019

Second Revision No. 30-NFPA 1700-2019 [Section No. 3.3.165]

3.3.167 Radiant Heat.

Heat energy carried by electromagnetic waves that are longer than light waves and shorter than radio waves; radiant heat (electromagnetic radiation) increases the ~~sensible~~ temperature of any substance capable of absorbing the radiation, especially solid and opaque objects. [~~**921,** 2017~~]

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Fri Mar 22 13:42:26 EDT 2019

Committee Statement

Committee Statement: definition modified to eliminate the word 'sensible". extract tag also removed.
Response Message: SR-30-NFPA 1700-2019

Public Comment No. 69-NFPA 1700-2018 [Section No. 3.3.165]

Second Revision No. 87-NFPA 1700-2019 [Section No. 3.3.168]

3.3.170 Rapid Intervention Crew~~/Company~~ (RIC).

A dedicated crew of ~~firefighters that are reserved at a fire incident to locate and rescue firefighters who are lost or entrapped within a building fire~~ at least one officer and three members, positioned outside the IDLH, trained and equipped as specified in NFPA 1407 , who are assigned for rapid deployment to rescue lost or trapped members . [**1710,**~~2016~~ 2020]

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Wed Apr 24 08:07:28 EDT 2019

Committee Statement

Committee Statement: Definition updated to match referenced edition of NFPA 1710.
Response Message: SR-87-NFPA 1700-2019

Second Revision No. 31-NFPA 1700-2019 [Section No. 3.3.220]

3.3.222 Transitional Attack.

The application of a fire stream from the exterior of a structure to improve ~~interior~~ conditions prior to ~~an offensive~~ interior fire ~~attack~~ control .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Fri Mar 22 13:52:40 EDT 2019

Committee Statement

Committee Statement: definition modified for clarity.

Response Message: SR-31-NFPA 1700-2019

Public Comment No. 24-NFPA 1700-2018 [Section No. 3.3.220]

Public Comment No. 50-NFPA 1700-2018 [Section No. 3.3.220]

Second Revision No. 86-NFPA 1700-2019 [Section No. 3.3.241]

3.3.243 Verified Independent Service Provider (ISP).

An independent service provider verified by a third-party certification organization to conduct ~~any one or a combination of~~ an advanced inspection, advanced cleaning and sanitization , basic repair, ~~or~~ and advanced repair service. [**1851,**~~2019~~ 2020]

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Tue Apr 23 14:23:22 EDT 2019

Committee Statement

Committee Statement: definition updated to match reference edition of NFPA 1851
Response Message: SR-86-NFPA 1700-2019

Second Revision No. 28-NFPA 1700-2019 [New Section after 3.3.245]

3.3.248* Watt (W).

Unit of power, or rate of work, equal to one joule per second, or the rate of work represented by a current of one ampere under the potential of one volt. [**921,** 2017]

A.3.3.248 Watt (W).

A watt is defined as one joule per second, a kilowatt is 1000 watts, and a megawatt is 1,000,000 watts.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Fri Mar 22 13:13:01 EDT 2019

Committee Statement

Committee Statement: The baseline unit of watt is define with annex text relative to kilowatt and megawatt.

Response Message: SR-28-NFPA 1700-2019

Public Comment No. 68-NFPA 1700-2018 [Section No. 3.3.125]

Second Revision No. 59-NFPA 1700-2019 [Section No. 3.3.245]

3.3.247 Water Supply.

The amount of water described in terms of gallons per minute that is available at a fire incident for fire ~~attack~~ control .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Apr 01 13:57:51 EDT 2019

Committee Statement

Committee Statement: Fire attacked change to fire control. The technical committee determined control as a more appropriate term for use in this definition.

Response Message: SR-59-NFPA 1700-2019

Second Revision No. 14-NFPA 1700-2019 [Section No. 4.1.3]

4.1.3

~~The changes to~~ Additional information has been made available to support selection of strategies and tactics that are based on evidence (i.e., knowledge) developed as part of research projects and as a result of line-of-duty death and injury after-action reports. The overarching objectives of all of these research endeavors was to increase the effectiveness of fire fighters and increase the safety of the public and fire fighters.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Wed Mar 20 15:51:57 EDT 2019

Committee Statement

Committee Statement: The goal of the document is to support tactics and strategy selection based on evidence.

Response Message: SR-14-NFPA 1700-2019

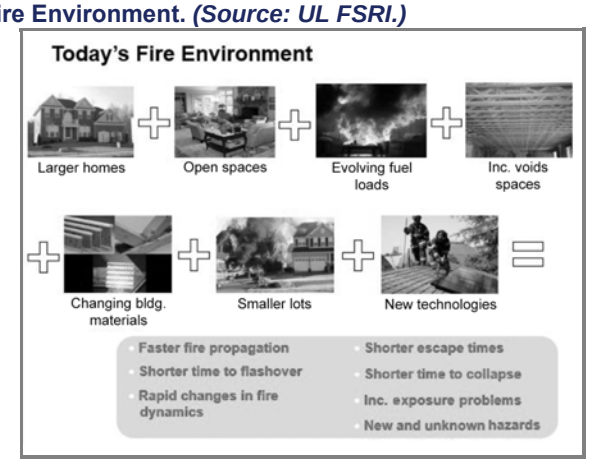
Public Comment No. 61-NFPA 1700-2018 [Section No. 4.1.3]

Second Revision No. 15-NFPA 1700-2019 [Section No. 4.3.2]

4.3.2 Changes in the Fire Fighters' Work Environment.

Over the past 50 years, changes in construction materials, construction methods, insulation, and furnishings have changed the means and the speed of fire growth within a structure. Both research experiments and line-of-duty death (LODD) and line-of-duty injury (LODI) investigations have demonstrated the importance of understanding how ventilation affects fire behavior. Fires in today's fire environment, fueled predominantly by synthetic materials, commonly become ventilation-limited. How, where, and when a fire receives oxygen greatly impacts the fire dynamics and the resulting thermal environment inside the structure. As outlined in Figure 4.3.2, many factors in the construction methods, building materials, fuel loads, and power technologies have transformed the fire fighters' working environment. The construction techniques and materials used to build a house over the past 50 years have changed. Engineered wood products have enabled long spans and open areas for improved use of living space in houses. Gypsum board interior linings have been reduced en masse by 30 percent in recent years. In order to increase the energy efficiency of houses, insulation has improved, walls are wrapped in plastic to limit incursion of air and water, and multipane, low-emissivity windows are now the norm. The objects and materials inside our homes have changed as well. Some areas have seen more of these changes than others. It is important to note that even though a jurisdiction may have very few newly built homes, many structures are being renovated using new building materials, construction methods, and design features.

Figure 4.3.2 Today's Fire Environment. ***(Source: UL FSRI.)***



Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Wed Mar 20 15:54:54 EDT 2019

Committee Statement

Committee Statement: It is important to note that even though a jurisdiction may have very few newly built homes, many structures are being renovated using new building materials, construction methods, and design features."

Response Message: SR-15-NFPA 1700-2019

Public Comment No. 29-NFPA 1700-2018 [Section No. 4.3.2]

Second Revision No. 58-NFPA 1700-2019 [Section No. 4.3.4.1]

4.3.4.1

During the same 50-year period, the tactics fire fighters use on the fireground have also changed. The reliance on indirect, or exterior, attack prior to entry changed to a focus on interior, direct ~~attack~~ fire control .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Apr 01 13:50:26 EDT 2019

Committee Statement

Committee Statement: The committee has determined that control is a appropriate term than attack for direct water application on the fire.

Response Message: SR-58-NFPA 1700-2019

Second Revision No. 16-NFPA 1700-2019 [Section No. 4.8]

4.8* Summary of Fire-Fighting Research.

Building on the scientific body of knowledge that supports the fire protection engineering discipline, research specific to fire-fighting tactics has been conducted. The results of the studies, referenced here, have been used as a basis of change for fire department standard operating procedures or guides ~~across North America~~ around the world . Experience in the field has shown positive results when tactics such as size-up, door control, coordinated ventilation, and exterior attack, prior to entry, have been used to accomplish the incident priorities of life safety, incident stabilization, and property conservation.

A.4.8

Many governmental fire fighter training organizations and fire departments have incorporated fire dynamics and evidence-based practices into their training documents and/or their standard operational procedures or guidelines. The following is a list of those organizations and fire departments, but it is not all-inclusive:

(1) In the United States, examples of fire departments that have incorporated fire dynamics and evidence-based practices include the following:

(a) Boston (MA) Fire Department
(b) Chicago (IL) Fire Department
(c) Cleveland (OH) Division of Fire
(d) Columbus (OH) Division of Fire
(e) Eau Claire (WI) Fire Department
(f) Fairfax County (VA) Fire and Rescue Department
(g) Fire Department City of New York (FDNY)
(h) Fort Worth (TX) Fire Department
(i) Hanover (VA) Fire EMS Department
(j) Houston (TX) Fire Department
(k) Laramie (WY) County Fire District #2
(l) Las Cruces (NM) Fire Department
(m) Los Angeles (CA) County Fire Department (LACoFD)
(n) Mesa (AZ) Fire and Medical Department
(o) Oklahoma City (OK) Fire Department
(p) Prince George's County (VA) Fire/Emergency Medical Services Department
(q) St. Petersburg (FL) Fire and Rescue
(r) San Jose (CA) Fire Department
(s) Tucson (AZ) Fire Department

(2) In Canada, many of the provincial organizations responsible for fire fighter training that have incorporated fire-dynamics-based fire tactics into their curriculums include the following:

(a) Justice Institute of British Columbia Fire and Safety
(b) Newfoundland Fire School
(c) Nova Scotia Fire School
(d) Ontario Fire College
(e) Ontario Association of Fire Training Officers
(f) IPIQ – Institut de protection contre les incendies du Québec
(g) Manitoba Emergency Services College

(3) Examples of Canadian fire departments that have incorporated fire dynamics and evidence-based practices include the following:

(a) District of North Vancouver Fire and Rescue Services
(b) Ottawa Fire Services
(c) Oakville Fire Department
(d) Hamilton Fire Department
(e) Calgary Fire Department
(f) Winnipeg Fire Paramedic Service
(g) Service d'Incendie de Montréal
(h) Halifax Regional Fire and Emergency

(i) Saint John Fire Department

(4) European fire departments that have implemented a fire dynamics training program include the following:

(a) Belgium: Brussels, Antwerp

(b) Croatia: Federal fire academy

(c) Finland: Federal fire academy

(d) France: Paris

(e) Germany: All 102 career departments especially the “big five”: Berlin, Hamburg, Munich, Cologne, Frankfurt; all 20 state fire academies (main target group: volunteer fire departments all over the country)

(f) Greece: Thessaloniki

(g) Great Britain: Federal fire academy, some regional fire academies, London, Liverpool (Merseyside), and Birmingham

(h) Netherlands: Amsterdam, the Hague, and the national and regional fire academies

(i) Poland: Federal fire academy

(j) Sweden: The two federal academies: Stockholm and Gothenburg

(k) Spain: Madrid

(l) Switzerland: Both federal fire academies

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Wed Mar 20 15:56:58 EDT 2019

Committee Statement

Committee Statement: Experience in the field has shown positive results. Explanatory text added for clarification. TC recognizes the agencies throughout the world that have incorporated fire dynamics and evidenced based practices.

Response Message: SR-16-NFPA 1700-2019

Public Comment No. 28-NFPA 1700-2018 [Section No. 4.8]

Second Revision No. 4-NFPA 1700-2019 [Section No. 6.4.2.1.1.5]

6.4.2.1.1.5

The outward flow is due to the higher pressure, relative to atmospheric pressure, created by the fire. Subsequently, a region of lower pressure is also created below the outflowing gases where fresh air is drawn into the fire compartment. The rate of air ~~entrapment~~ entrainment to the fire is influenced by the rate of outflowing gases. If outflow increases, air entrainment will also increase. The height at which the flow changes direction is known as the neutral plane.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Mar 19 09:53:13 EDT 2019

Committee Statement

Committee Statement: Correcting language

Response Message: SR-4-NFPA 1700-2019

Public Comment No. 70-NFPA 1700-2018 [Section No. 6.4.2.1.1.5]

Second Revision No. 33-NFPA 1700-2019 [Section No. 6.4.2.1.2.1]

6.4.2.1.2.1

Flashover, which is a rapid transition of a growth phase fire to a fully developed fire, is a dangerous phenomenon and has claimed the lives of countless fire fighters. Time to flashover from ignition was as little as 3 to 5 minutes ~~in residential room test fires~~ .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Fri Mar 22 14:23:01 EDT 2019

Committee Statement

Committee Statement: Flashover can occur within seconds after providing ventilation to vent-limited (decay) fires.

Response Message: SR-33-NFPA 1700-2019

Second Revision No. 34-NFPA 1700-2019 [Section No. 6.4.2.2.4.1]

6.4.2.2.4.1

Flashover~~, which is a rapid transition of a growth phase fire to a fully developed fire, is a dangerous phenomenon and has claimed the lives of countless fire fighters. Flashover times of 3 to 5 minutes are not unusual in residential room fire tests~~ can occur within seconds after providing ventilation to vent-limited (decay) fires .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Fri Mar 22 14:24:38 EDT 2019

Committee Statement

Committee Statement: Flashover can occur within seconds after providing ventilation to vent-limited (decay) fires.

Response Message: SR-34-NFPA 1700-2019

Public Comment No. 71-NFPA 1700-2018 [Section No. 6.4.2.2.4.1]

Public Comment No. 17-NFPA 1700-2018 [Section No. 6.4.2.2.4.1]

Second Revision No. 60-NFPA 1700-2019 [Section No. 6.5.7]

6.5.7

Intake portions of the flow path exist below the neutral plane and allow fresh air into the structure. The safest position from which to mount an interior fire ~~attack~~ control is to place fire fighters on the intake side of the flow path.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Apr 01 14:03:20 EDT 2019

Committee Statement

Committee Statement: The committee determined that control is a more appropriate term versus attack with direct application of water on the fire.

Response Message: SR-60-NFPA 1700-2019

Second Revision No. 61-NFPA 1700-2019 [Section No. 6.8.4]

6.8.4

~~Two primary~~ Primary hazards associated with basement (i.e., belowgrade) fires include the following:

(1) The likelihood of structural collapse. A collapse will represent a vertical vent for the fire and will result in an increase in fire intensity.

(2) Increased potential that fire fighters will be operating in the exhaust flow as they position themselves for a fire ~~attack~~ control . Flows at the top of the stairs can reach speeds of 20 mph (32.2 kph) and will present an extreme risk for any personnel positioned at the top of the stairs.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Apr 01 14:06:17 EDT 2019

Committee Statement

Committee Statement: The committee changed attack to control when addressing direct application of water on the fire.

Response Message: SR-61-NFPA 1700-2019

Second Revision No. 17-NFPA 1700-2019 [Sections 6.13, 6.14, 6.15]

~~**6.13** Basement Fire Research.~~

~~The technical committee has established a task group to incorporate the findings of research on basement fires and may incorporate suggestions for tactical considerations.~~

~~**6.14** Fire Attack Research.~~

~~The technical committee is evaluating the findings of studies related to fire attack and may incorporate suggestions for tactical considerations.~~

~~**6.15** Other Fire Dynamics Research.~~

~~The technical committee is evaluating the findings of studies related to fire dynamics and may incorporate suggestions for tactical considerations.~~

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Wed Mar 20 16:02:15 EDT 2019

Committee Statement

Committee Statement: sections are deleted, no additional information added by the committee or public are added to these sections and have no value at this time.

Response Message: SR-17-NFPA 1700-2019

Public Comment No. 30-NFPA 1700-2018 [Sections 6.14, 6.15]

Second Revision No. 35-NFPA 1700-2019 [Section No. 7.5.1.4]

7.5.1.4 Vulnerabilities of Type I Buildings.

Examples of Type I building vulnerabilities include the following:

(1) Elevators to get to fire floor (high-rise)

(2) ~~No ladder~~ Limited ladder truck access (high-rise)

(3) Fire could be remote from building entry

(4) Need controlled evacuation/movement of occupants

(5) Limited entrance and egress to fire floor

(6) Must rely on building fire protection and life safety features (command center, fire pump, sprinkler system, standpipes)

(7) Complex ventilation issues (heat, smoke control, stratification of smoke produced)

(8) Transport of personnel and equipment to upper floors (weight, fatigue)

(9) Delay in response to fire area

(10) Wind-driven

(11) Collapse zone should be considered (larger than other types of construction)

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Fri Mar 22 14:27:04 EDT 2019

Committee Statement

Committee Statement: Aerial apparatus has its uses even at high rise Type 1 building if the fire is on a lower floor or if the bucket is used to ferry equipment closer to the staging floor if there are elevator issues to conserve members energy

Response Message: SR-35-NFPA 1700-2019

Public Comment No. 2-NFPA 1700-2018 [Section No. 7.5.1.4]

Second Revision No. 89-NFPA 1700-2019 [Section No. 7.8]

~~**7.8** Consideration of Building Use, Life Cycles, and Alterations. (Reserved)~~

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Mon May 13 13:55:58 EDT 2019

Committee Statement

Committee Statement: Section deleted. No requirement identified.
Response Message: SR-89-NFPA 1700-2019

Second Revision No. 88-NFPA 1700-2019 [Section No. 8.4]

8.4 Thermal Testing Requirements for Fire Fighter Protective Clothing and Equipment.

The criteria for thermal limitation, time exposed, and test method is compiled from the most current edition of the applicable standard at the time of publication. The fire fighter should be aware of these minimum requirements and how their equipment is tested as it compares to their work environment. Additionally, standards are continually evolving, and gear and equipment can be used that is tested to different criteria or no criteria. *(See Table 8.4.)*

Table 8.4 Thermal Testing Requirements for Fire Fighter Protective Clothing and Equipment

Firefighting Gear and Equipment (NFPA Reference Standard-Edition)	Thermal Limitations	Time Exposed	Standard Test Method
Helmet flaps (1971–~~2013~~ 2018)	500°F (260°C)	5 minutes	Heat and thermal shrinkage resistance — convective oven
	7.39 Btu/ft^2 (84 kW/m^2)	Minimum TPP — 20	Thermal protective performance (TPP) test
	Open flame	12 to 15 seconds	Flame resistance test — Bunsen burner
Face shield and goggle components (1971–~~2013~~ 2018)	Open flame	15 seconds	Flame resistance test — Bunsen burner
Helmet (1971–~~2013~~ 2018)	Open flame	15 seconds	Flame resistance — Bunsen burner
	Open flame and 0.88 Btu/ft^2 (10 kW/m^2)	60 seconds followed by 15 seconds	Bunsen Burner and radiative source
Hood (1971–~~2003~~ 2018)	500°F (260°C)	5 minutes	Heat and thermal shrinkage resistance — convective oven
	7.39 Btu/ft^2 (84 kW/m^2)	Minimum TPP — 20	Thermal protective performance (TPP) test
	Open flame	12 to 15 seconds	Flame resistance test — Bunsen burner
Protective coat and trousers (1971–~~2013~~ 2018)	500°F (260°C)	5 minutes	Heat and thermal shrinkage resistance — convective oven
	7.39 Btu/ft^2 (84 kW/m^2)	Minimum TPP — 35	Thermal protective performance (TPP) test
	Open flame	12 to 15 seconds	Flame resistance test — Bunsen burner
Gloves (1971–~~2013~~ 2018)	500°F (260°C)	5 minutes	Heat and thermal shrinkage resistance — convective oven
	Open flame	12 to 15 seconds	Flame resistance test — Bunsen burner
Boots (1971–~~2013~~ 2018)	500°F (260°C)	5 minutes	Heat and thermal shrinkage resistance — convective oven
	Open flame	12 seconds	Flame resistance test — heptane fueled pan fire
Station/work uniform (1975–~~2014~~ 2019)	500°F (260°C)	10 minutes — hot air circulating	Heat and thermal shrinkage resistance — convective oven

Firefighting Gear and Equipment (NFPA Reference Standard-Edition)	Thermal Limitations	Time Exposed	Standard Test Method
	510°F (265°C)	10 seconds — flame resistance test 3 in. × 12 in. rectangle specimen	Thermal stability (sticking) — convective oven
	Exists in ASTM D6413/D6413M	12 seconds	Direct flame — flame resistance of textiles (vertical test)
SCBA ensemble (1981–~~2013~~ 2019)	350°F (177°C)	15 minutes	Environmental test
	Oven test 500°F (260°C)	5 minutes	Oven test — complete SCBA
	Precondition at 1500°F–2102°F (815°C–1150°C) followed by open flame contact ~~1500°F–2102 °F (815°C–1150°C)~~	5 minute oven test	Elevated temperature test — complete SCBA
	Open flame	10 seconds	
SCBA facepiece (1981–~~2013~~ 2019)	Precondition at 203°F (95°C) followed by open flame contact ~~1500°F–2102°F (815°C–1150°C)~~	15 minutes	Heat and flame test
	Open flame	10 seconds	
	500°F (260°C)	5 minutes	Elevated heat and flame resistance test
	1.32 Btu/ft^2 (15 kW/m^2)	5 minutes	Radiant heat test panel
Pass devices (1982–~~2013~~ 2018)	350°F (177°C) oven test	15 minutes	Heat and immersion resistance test
	500°F (260°C) oven test	5 minutes	High-temp functionality test
	Precondition at 203°F (95°C) oven test followed by 1500°F–2102°F (815°C–1150°C)	15 minutes	Heat and flame resistance test
	Open flame	10 seconds	
Thermal imagers (1801–~~2013~~ 2018)	203°F (95°C)	15 minutes	Heat and flame test
	Open flame	10 seconds	
	500°F (260°C)	5 minutes	Heat resistance test
Escape ropes (1983–~~2013~~ 2017)	~~750~~ 752 °F (400°C)	5 minutes 300 lb (136 kg) dead load	Elevated temperature rope test
	~~1110~~ 1112 °F (600°C)	45 seconds 300 lb (136 kg) dead load	Elevated temperature rope test
Hose* (1961–~~2013~~ 2020)	500°F (260°C)	5 minutes	UL-19 hot block test
	158°F (70°C)	96 hours	Oven aging test
	–4°F (–20°C)	24 hours	Cold bending and flexibility test
Nozzles (1964–~~2013~~ 2018)	135°F (57°C) and –25°F (–32°C)	24 hours	Hot conditioning then function test
			Cold conditioning then function test and rough-handling tests

Firefighting Gear and Equipment (NFPA Reference Standard-Edition)	Thermal Limitations	Time Exposed	Standard Test Method
Ladders (1931–~~2015~~ 2020)	At 300°F (149°C)	N/A	Pass all of the tests while maintaining 75% strength

*The NFPA Technical Committee is currently investigating changes to the thermal protection requirements for fire hose.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Fri Apr 26 12:01:39 EDT 2019

Committee Statement

Committee Statement: Updates to referenced documents. Minor editorial corrections to correlate with referenced documents.

Response Message: SR-88-NFPA 1700-2019

Second Revision No. 41-NFPA 1700-2019 [Section No. 9.4.1]

9.4.1 Existing Reference Materials.

Materials such as pre-incident plans and maps should be developed per ~~Chapter 4 of~~ NFPA 1620, providing information regarding the structure, its contents, and occupancy.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Mar 25 13:05:54 EDT 2019

Committee Statement

Committee Statement: The committee determined that NFPA 1620 as a whole has value in referencing for pre-incident planning.

Response Message: SR-41-NFPA 1700-2019

Public Comment No. 1-NFPA 1700-2018 [Section No. 9.4.1]

Second Revision No. 43-NFPA 1700-2019 [Section No. 9.5.2]

9.5.2

Initial arrival factors should include considerations of the following:

(1) Bystander/witness statements
(2) Access concerns on the property
(3) Building height, size, and stability
(4) Occupancy type
(5) Construction type
(6) Wind direction relative to the building location and configuration
(7) Fire location, size, extent
(8) Civilian and fire fighter life safety ~~profile~~
(9) Suspected direction of fire and smoke travel within the structure (flow path)
(10) Smoke and fire exposures exterior to the structure
(11) Presence and status of fixed fire protection systems
(12) Fire fighter safety building marking systems
(13) Resources available

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Mon Mar 25 13:16:45 EDT 2019

Committee Statement

Committee Statement: "Profile" removed from "Civilian and fire fighter life safety"
Response Message: SR-43-NFPA 1700-2019

Second Revision No. 42-NFPA 1700-2019 [Section No. 9.6.3]

9.6.3

The use of a 360-degree survey of a structure fire is extremely important ~~to~~ concerning the ~~assessment~~ possible location of occupants, fire dynamics, and crew safety~~, and the life safety profile within the structure~~ information. The exterior survey should provide essential data to develop an incident action plan .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Mar 25 13:12:40 EDT 2019

Committee Statement

Committee Statement: The life safety strategy and objectives are the highest priority at any fire incident and the submitter's concern about life safety are addressed in the 2nd revision created.

Response Message: SR-42-NFPA 1700-2019

Public Comment No. 57-NFPA 1700-2018 [Section No. 9.6.3]

Second Revision No. 44-NFPA 1700-2019 [Section No. 9.7.4]

9.7.4 Assessing Flow Path.

The flow path is the route by which the flow of gases, including air and fire gases, move from high pressure to low pressure. Initial arriving companies need to evaluate all existing openings in the building to develop an accurate ventilation profile for the early stages of the incident prior to determination of strategy. Flow path assessment should include an evaluation of the neutral plane relative to the size and physical position of the opening in relation to the fire location. Another consideration should include the direction of flow within each opening. Opening of doors and windows for the purposes of fire fighter entry can affect the flow path and should be considered. Some things to consider when ~~assess~~ assessing the flow ~~are: unidirectional flow from opening, bi-directional Flow from opening, and position of the neutral plane~~ path are the type of flow (i.e., unidirectional, bidirectional, or dynamic) and the characteristics of the flow (i.e., height within the boundaries of a compartment or at an opening, the degree of turbulence and its direction, velocity, and shape) .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Mar 25 13:31:54 EDT 2019

Committee Statement

Committee Statement: The revised sentence reflects the intent of the assessment and is in keeping with the types and characteristics of flow utilized within the guideline.

Response Message: SR-44-NFPA 1700-2019

Public Comment No. 128-NFPA 1700-2018 [Section No. 9.7.4]

Second Revision No. 47-NFPA 1700-2019 [Section No. 9.10.2]

9.10.3

The decision for implementing the offensive strategy is predicated on the ability of the IC to consider the most effective ~~and safe~~ fire control positions ~~for all fire suppression personnel~~ . ~~The following tasks should be performed:~~

~~Operate on the intake portion of existing and potential flow paths.~~

~~Operate on the upwind side of the structure.~~

~~Operate on the same level or below the fire.~~

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Mar 25 14:15:22 EDT 2019

Committee Statement

Committee Statement: The committee revised the section for simplicity.

Response Message: SR-47-NFPA 1700-2019

Public Comment No. 34-NFPA 1700-2018 [Section No. 9.10.2]

Second Revision No. 45-NFPA 1700-2019 [Section No. 9.10.3.1]

9.10.2

Life safety is the greatest consideration when determining the overall incident strategy.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Mar 25 13:59:13 EDT 2019

Committee Statement

Committee Statement: The committee identified that this section should precede the strategic decision process of an offensive or defensive approach.

Response Message: SR-45-NFPA 1700-2019

Public Comment No. 35-NFPA 1700-2018 [Section No. 9.10.3]

Second Revision No. 46-NFPA 1700-2019 [New Section after 9.10.3.2]

9.11 Strategy Implementation.

9.11.1

The IC should make the strategy known via verbal or radio communications through the chain of command so that all on-scene personnel are aware.

9.11.2

Whenever there is a change of strategy, the IC should make the new strategy known via verbal or radio communications through the chain of command so that all on-scene personnel are aware.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Mar 25 14:03:28 EDT 2019

Committee Statement

Committee Statement: The committee determined that notifying on-scene personnel of the strategy and any subsequent changes is important. The committee identified the PAR requirement as not required for this section.

Response Message: SR-46-NFPA 1700-2019

Public Comment No. 38-NFPA 1700-2018 [New Section after 9.10.3.2]

Second Revision No. 50-NFPA 1700-2019 [Section No. 10.4.1]

10.4.1

The primary mission on the fireground is life safety; therefore, ~~attack~~ fire control , ~~along with~~ search, and ventilation/nonventilation become primary tactical objectives. How, where, and with how many fire fighters each department operates on the fireground should be based on an ongoing (exterior and interior) size-up. Since the fireground is not black and white, there is no single tactic that is ideal for all fires. ~~The goal of fireground operations is to make sure that all of our actions are coordinated~~ Coordinated actions are identified in this chapter and Chapter 12 .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Mar 26 10:09:31 EDT 2019

Committee Statement

Committee Statement: Update to fire control for consistent terminology. Coordinated actions are still identified.

Response Message: SR-50-NFPA 1700-2019

Public Comment No. 72-NFPA 1700-2018 [Section No. 10.4.1]

Public Comment No. 90-NFPA 1700-2018 [Section No. 10.4.1]

Public Comment No. 129-NFPA 1700-2018 [Section No. 10.4.1]

Public Comment No. 105-NFPA 1700-2018 [Section No. 10.4.1]

Public Comment No. 87-NFPA 1700-2018 [Section No. 10.4.1]

Second Revision No. 51-NFPA 1700-2019 [Section No. 10.4.2]

10.4.2

On the fireground, coordination means that all of the crews operating on the fireground are working together. It means that timing is precise, movements are well choreographed, and communications are clear and concise. Specifically, fire ~~attack~~ control , search ~~(~~ and ~~obviously~~ rescue~~)~~ , and ventilation/nonventilation crews should all operate as one. Coordinated fireground operations enhance life safety, incident stabilization, and property conservation.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Mar 26 10:19:22 EDT 2019

Committee Statement

Committee Statement: Remove unnecessary language

Response Message: SR-51-NFPA 1700-2019

Public Comment No. 73-NFPA 1700-2018 [Section No. 10.4.2]

Public Comment No. 76-NFPA 1700-2018 [Section No. 10.4.2]

Second Revision No. 62-NFPA 1700-2019 [Section No. 10.4.3]

10.4.3

Conditions, staffing, and resources should drive fireground tactics and tasks. While the majority of this chapter focuses on fire ~~attack~~ control and ventilation (water and air), that is not because search and rescue is being minimized, it is only because this document is driven by empirical data, and the fire service has yet to truly dissect the tactic and tasks of search and rescue. Search and rescue is, and always will be, of utmost importance to the fire service and to unprotected occupants. Although we ~~don't~~ do not yet have empirical data on search, the fire service does have data points on occupant survivability. We now know that, apart from fire department operations, three things impact the survivability of a given space in the structure: the proximity to the fire, the elevation in the space, and whether or not the room/volume is isolated from the fire.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Apr 01 14:11:31 EDT 2019

Committee Statement

Committee Statement: fire control is identified as the more appropriate term and is also defined versus fire attack.

Response Message: SR-62-NFPA 1700-2019

Second Revision No. 52-NFPA 1700-2019 [Section No. 10.4.5]

10.4.5

~~Data states that removing~~ Removing any potential ~~victim~~ victims from the hazardous atmosphere as soon as possible after arrival is essential to minimizing ~~the fractional effective dose~~ their exposure , ~~therefore~~ thereby increasing their chance of survival. As the ~~fractional effective~~ exposure dose is a function of the time ~~a victim~~ an individual is exposed to the hazard (i.e., thermal exposure and/or toxic gases), the earlier into an incident the ~~victim~~ occupant is removed from the atmosphere, the ~~less fractional effective~~ lower dose ~~they~~ he/she is likely to have been exposed to and the greater ~~their~~ the chances for survival. Finding them is the first step to removing them, and therefore searches need to start as soon as possible.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Mar 26 10:26:47 EDT 2019

Committee Statement

Committee Statement: "Fractional effective dose" terminology is unnecessary for the expected user of the guideline.

Response Message: SR-52-NFPA 1700-2019

Public Comment No. 74-NFPA 1700-2018 [Section No. 10.4.5]

Second Revision No. 53-NFPA 1700-2019 [Section No. 10.4.6]

10.4.6

While this chapter ~~doesn't~~ does not focus on search, it is still essential to our operations and therefore is defined and mentioned here. Primary search is the fast, yet thorough, search for life and fire. At residential fires, fire ~~attack~~ control and ventilation are there to support the primary search. ~~This doesn't mean that at every fire search should be the first task, but it means that it should still be an option.~~ A primary search needs to be conducted in all involved and exposed buildings that can be entered. ~~Depending on the fire size and location, building layout, the location of hose lines, and so forth, the search group (through the IC) will decide what search tactic(s) is/are most appropriate (e.g., oriented search, VEIS, split search).~~ As more research is conducted, and more data made available to the fire service, this chapter will continue to evolve to help improve efficiency and effectiveness on the fireground.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Mar 26 10:29:52 EDT 2019

Committee Statement

Committee Statement: The specific tactics of VEIS, search groups, and split crews are removed.

Response Message: SR-53-NFPA 1700-2019

Public Comment No. 116-NFPA 1700-2018 [Section No. 10.4.6]

Second Revision No. 63-NFPA 1700-2019 [Section No. 10.4.11]

10.4.11

Coordination of operational practices requires clear, direct communication between command and companies or crews assigned to fire ~~attack~~ control , ventilation, and other tactical (e.g., search, rescue) functions that are or will be taking place inside a structure. Coordination in this sense is the act of working together and implies a tactical plan that is matched to the incident risks and the available resources to manage those risks.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Apr 01 14:14:20 EDT 2019

Committee Statement

Committee Statement: The committee identified control as the more appropriate term versus attack.

Response Message: SR-63-NFPA 1700-2019

Second Revision No. 54-NFPA 1700-2019 [Section No. 10.4.13]

10.4.13

More people are saved by a well-placed and advanced hose line than by any other tactic. Controlling the fire ~~removes the hazard from the victim, which is much more efficient than trying to locate and remove the victim from the hazard~~ reduces the exposure hazards to the victim and facilitates a more effective primary search . In the absence of confirmed viable occupants, it is vital to find, control, ~~attack,~~ and extinguish the fire as quickly as possible.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Mar 26 10:41:44 EDT 2019

Committee Statement

Committee Statement: The committee revised the section to reinforce the concept of eliminating or reducing a fires capacity to generate products of combustion can help the survivability occupants of a fire building and to locate those occupants.

Response Message: SR-54-NFPA 1700-2019

Public Comment No. 43-NFPA 1700-2018 [Section No. 10.4.13]

Second Revision No. 55-NFPA 1700-2019 [Section No. 10.4.14]

10.4.14

When high-priority tasks can be accomplished *simultaneously*, it is important to support and protect the rescue or search operations using hose line(s) and flow path management. Ignoring the fire during search and/or rescue operations is a recipe for disaster. If the fire is extinguished early enough, there will be less smoke, heat, flame, and potential for rapid fire development and its associated dangers. Regardless of the assigned priorities of on-scene crews, a fire ~~attack~~ control crew should ~~never ignore a victim~~ not overlook the needs of a trapped occupant , and a rescue or search crew should ~~never ignore a~~ not disregard the risks presented by active fire.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Mar 26 10:49:20 EDT 2019

Committee Statement

Committee Statement: The word “never” is utilized. While the message being conveyed makes sense, is this definitive language is not appropriate for a guide.

Response Message: SR-55-NFPA 1700-2019

Public Comment No. 75-NFPA 1700-2018 [Section No. 10.4.14]

Second Revision No. 5-NFPA 1700-2019 [Section No. 10.5.3]

10.5.3 Exterior Control — Transitional Attack .

10.5.3.1 Tactical Objective.

The objective is to improve occupant tenability and interior conditions for fire ~~attack~~ control .

10.5.3.2 How It Works.

The following are examples of successful outcomes of exterior control-transitional fire control:

(1) Compartment linings and burning fuel surfaces are cooled, interfering with pyrolysis, which halts flaming combustion and in turn reduces the heat release rate.

(2) Reducing surface temperature of unignited fuels stops pyrolysis.

(3) The flame is displaced from the surface of burning fuels.

(4) Steam production absorbs energy from the environment to cool smoke.

10.5.3.3 Tactical Considerations.

The following are tactical considerations:

(1) Coordinated to support other fire operations (e.g., fire ~~attack~~ control /rescue)

(2) Performed from an exterior position

(3) Optimal through a ventilation opening to the fire room

(4) Flow path not disrupted

(5) Flow rate appropriate with heat release rate and area of involvement; balanced to avoid excessive water damage

(6) Rapid interior ~~attack~~ control following/concurrent with exterior control crucial to limit regrowth and maintain tenability

(7) Limited on-scene resources, large fire volume, delayed entry time/access for direct fire ~~attack~~ control may require multiple or longer applications; more time equals more water

10.5.3.4 Preferred Technique.

The preferred technique is a *stationary* straight or solid stream hand line through the bottom third of an opening, at a steep angle, deflected off the ceiling in the fire room, with care taken to not disrupt the flow path.

10.5.3.5 Alternative Technique.

The following are alternative techniques:

(1) Master stream devices/appliances

(2) Water application to eaves for attic ~~attack~~ fire control

(3) Floor below nozzle or rotary nozzle from above for high-rise structures

10.5.3.6 Safety Considerations.

The following are safety considerations:

(1) Improper nozzle application may disrupt flow path and can injure or kill occupants and/or interior fire fighters.

(2) Change of flow path may also result in rapid fire growth to other uninvolved areas.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Wed Mar 20 09:27:16 EDT 2019

Committee Statement

Committee Statement: The committee added Attack with Transitional.

Response Message: SR-5-NFPA 1700-2019

Public Comment No. 117-NFPA 1700-2018 [Section No. 10.5.3]

Second Revision No. 56-NFPA 1700-2019 [Sections 10.5.4, 10.5.5]

10.5.4 Interior Advancement ~~— Surface Cooling~~ .

10.5.4.1 Tactical Objective.

The primary tactical objective is to ~~reduce~~ cool and control smoke temperature, flammability, and radiation~~, and HRR as a safer means of~~ to increase safety during interior progression to the seat of the fire and until effective water is applied to the source fire.

10.5.4.2 How ~~it~~ It Works.

~~The following are examples of successful outcomes of interior advancement — surface cooling fire control:~~

~~Water cools burning fuel surfaces interfering with pyrolysis, which halts flaming combustion and in turn reduces the heat release rate.~~

~~The flame is displaced from the surface of burning fuels.~~

~~Reducing surface temperature of unignited fuels stops pyrolysis.~~

~~Secondary steam production absorbs energy from the environment to cool smoke.~~

10.5.4.2.1 Straight Stream/Solid Bore Application.

The following are examples of successful outcomes using straight stream/solid bore application:

(1) Water is used to cool hot compartment surfaces, which allow those surfaces then to have the ability to absorb more thermal energy from the hot smoke layer.

(2) Water deflection off the ceiling cools the hot gases as droplets travel through the hot layer.

(3) Steam created from cooling both the ceiling area and hot gases will further absorb thermal energy as the steam is heated to equalize with the hot layer.

10.5.4.2.2 Fog Stream Application.

The following are examples of successful outcomes using fog stream application:

(1) Water droplets applied to the smoke volume convert to steam cooling the smoke.

(2) Steam conversion reduces temperature causing contraction and dilution of smoke, resulting in reduced flammability and radiation.

10.5.4.3 Tactical Considerations.

The following are tactical considerations:

(1) These are not extinguishment techniques but a means of safer interior progression to the seat of the fire.

(2) Factors that affect these techniques include fire intensity, room size and configuration, location, ventilation profile, and distance to the source fire.

(3) Effectiveness of the water application technique and reapplication should be continuously assessed while advancing.

(4) Water must be applied to the source fire as soon as possible with consideration given to safe positioning.

~~Ventilation should be coordinated until water is applied to main body of fire.~~

(5) Optimal position, nozzle pattern, and technique should be evaluated to maximize or minimize air entrainment/movement based on ventilation conditions and flow path.

~~Fire fighters should avoid advancing under a superheated thermal layer without cooling as they advance.~~

(6) Ventilation should be coordinated until water is applied to the main body of fire.

(7) Limiting ventilation with door control will increase the effectiveness of smoke cooling techniques and should be considered.

(8) If the intent is to move smoke ahead of the advancing crew, a large and sufficient vent opposite the advancing crew is required.

(a) The hose stream can then be moved rapidly and consistently in an O, T, Z, or ∩ pattern to maximize air movement.

(b) Utilize a reach and penetration of the stream to wet all surfaces forward of the operating position.

(c) A ~~narrow fog or straight stream~~ "flow and move" technique is most effective ~~for fires in one- and two- story family~~ in dwellings with a known fire location~~. If,~~ , or if a "shut down and move" technique is utilized, reapplication of water ~~every 10 to 15 seconds~~ as needed to control heat rebound of fire is necessary.

10.5.4.4 Preferred Technique.

~~A narrow fog or straight stream "flow and move" technique is most effective for fires in one- and two- story family dwellings with a known fire location. If a "shut down and move" technique is utilized, reapplication of water every 10 to 15 seconds to control heat rebound of fire is necessary. The~~ A straight stream/smooth bore application is preferred with the following ~~are preferred~~ techniques to consider:

~~Utilize a reach and penetration of the stream to wet all surfaces forward of the operating position.~~

~~Utilize a rapid, consistent O, T, Z, or N pattern with the hose stream to maximize air movement if the intent is to move smoke ahead of the operating position.~~

~~Water application should quickly transition to an attack on the source fire.~~

~~Apply reach and penetration of the stream to provide a standoff distance from the effects of fire.~~

(1) Utilize a reach of the stream to wet all surfaces forward of the crew position.

(2) A straight stream pattern should be flowed and swept across the ceiling area.

(3) New ceiling areas should be swept and cooled while advancing towards the fire area.

(4) The frequency and extent of the water application is influenced by fire intensity, smoke temperatures, room size and configuration, location, and distance to the source fire.

10.5.4.5 Alternative Technique.

~~Smoke cooling is an alternative technique to consider for interior advancement — surface cooling.~~ A fog stream application is an alternative with the following techniques to consider:

(1) Water mist or fog stream is directed into the smoke layer in short or long pulses (with a sweeping motion).

(2) Nozzle, cone angle, pulse duration, and flow rate are important in achieving an optimal droplet size of 0.12 in. (0.3 mm); this ensures effective cooling and contraction of the smoke and lessens the disruption of the thermal balance.

(3) Avoid contact with hot surfaces to prevent excess wet steam and disruption of thermal balance.

(4) Reapplication is necessary during advance.

(5) Water application should quickly transition to extinguishment on the source fire.

10.5.4.6 Safety Considerations.

The following are safety considerations:

~~Door/vent control should be maintained with an unknown fire location.~~

(1) Fire fighters should avoid advancing under a superheated thermal layer without cooling as they advance.

(2) Hose stream air entrainment should be limited when no vent is available opposite the fire.

(3) Continuous monitoring of cooling effectiveness against fire conditions with a thermal imager should be maintained while advancing to the source fire.

(4) PPE can be quickly compromised during interior advancement within a convective flow.

(5) Wind speed and direction in relation to intended flow path should be checked prior to and during cooling operations.

~~**10.5.5** Interior Advancement — Smoke Cooling.~~

~~**10.5.5.1** Tactical Objective.~~

~~The primary tactical objective is to reduce and control smoke flammability, radiation, and HRR during interior advancement as a safer means of progression until effective water is applied to the source fire.~~

~~**10.5.5.2** How it Works.~~

~~The following are examples of successful outcomes of interior advancement — surface cooling fire control:~~

~~Smoke is cooled through energy transfer to injected water droplets converting to steam within the treated smoke volume.~~

~~Steam conversion reduces temperature causing contraction and dilution of smoke, resulting in a reduction flammability, radiation, and of the HRR.~~

~~**10.5.5.3** Tactical Considerations.~~

~~The following are not considered extinguishment techniques but a means of safer interior progression to the seat of the fire:~~

~~Factors that affect these techniques include fire intensity, room size and configuration, location, and distance to the source fire.~~

~~Effectiveness of water application technique and reapplication should be continuously assessed while advancing.~~

~~Water must be applied to the source fire as soon as possible with consideration given to safe positioning.~~

~~Ventilation must be limited until water is applied to the main body of the fire.~~

~~Firefighters should avoid advancing under a superheated thermal layer without cooling as they advance.~~

~~**10.5.5.4** Preferred Technique.~~

~~The following are examples of preferred techniques of interior advancement — surface cooling fire control:~~

~~Water mist or fog stream is directed into the smoke track in short or long pulses (with a sweeping motion).~~

~~Nozzle, cone angle, pulse duration, and flow rate are important in achieving an optimal droplet size of 0.12 in. (0.3 mm); this, ensures effective cooling and contraction of the smoke and lessens the disruption of the thermal balance.~~

~~Avoid contact with hot surfaces to prevent excess wet steam and disruption of thermal balance.~~

~~Reapplication is necessary during advance.~~

~~Combine the smoke cooling as soon as possible with a direct or indirect attack on the source fire.~~

~~**10.5.5.5** Alternative Technique.~~

~~An alternative technique to interior advancement — smoke cooling might be to provide careful application of a standard fog nozzle or fog- or mist-producing piercing applicator for a surface cooling.~~

~~**10.5.5.6** Safety Considerations.~~

~~The following are safety considerations:~~

~~The door/vent control should be maintained with an unknown fire location.~~

~~Maintain door/vent control until effective water is on the source fire.~~

~~Continuous monitoring of cooling effectiveness against fire conditions with a thermal imager should be maintained while advancing to source fire.~~

~~PPE can be quickly compromised during interior advancement within a convective flow.~~

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Mar 26 11:10:20 EDT 2019

Committee Statement

Committee Statement: The committee consolidated the smoke cooling and surface cooling sections to emphasized the use of straight stream or smooth bore water application versus a fog stream application.

Response Message: SR-56-NFPA 1700-2019

Public Comment No. 114-NFPA 1700-2018 [New Section after 10.5.4]

Public Comment No. 99-NFPA 1700-2018 [Section No. 10.5.4.4]

Public Comment No. 98-NFPA 1700-2018 [Section No. 10.5.5]

Public Comment No. 113-NFPA 1700-2018 [New Section after 10.5.5.4]

Public Comment No. 3-NFPA 1700-2018 [Section No. 10.5.5.4]

Public Comment No. 58-NFPA 1700-2018 [Section No. 10.5.5.4]

Second Revision No. 65-NFPA 1700-2019 [Section No. 10.5.6.2]

10.5.5.2 How It Works.

The following are examples of successful outcomes of interior direct ~~attack~~ fire control:

(1) Water cools burning fuel surfaces interfering with pyrolysis, which halts flaming combustion and in turn reduces the heat release rate.

(2) The flame is displaced from the surface of burning fuels.

(3) Reducing surface temperature of unignited fuels stops pyrolysis.

(4) Secondary steam production absorbs energy from the environment to cool smoke.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Apr 01 14:29:19 EDT 2019

Committee Statement

Committee Statement: redundant wording removed.

Response Message: SR-65-NFPA 1700-2019

Second Revision No. 66-NFPA 1700-2019 [Section No. 10.5.6.3]

10.5.5.3 Tactical Considerations.

The following are tactical considerations:

(1) Direct ~~attack~~ fire control should be conducted as soon as the fire seat is located and can be reached with a water stream.

(2) Direct water application should be performed from an interior or exterior position to the fire room.

(3) The flow rate should be appropriate with the heat release rate and area of involvement and balanced to avoid excessive steam generation and water damage.

(4) The ideal position is the air intake side of the flow path with flow path control.

(5) Optimal position, nozzle pattern, and technique should be evaluated to maximize or minimize air entrainment/movement based on ventilation conditions and flow path.

(6) Advance should be matched to interior conditions.

(7) Smoke or surface cooling prior to direct attack may be appropriate.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Mon Apr 01 14:31:43 EDT 2019

Committee Statement

Committee Statement: The committee determined that fire control is the more appropriate term for this section.

Response Message: SR-66-NFPA 1700-2019

Second Revision No. 57-NFPA 1700-2019 [Section No. 10.5.6.4]

10.5.5.4 Preferred Technique.

The following are preferred techniques:

(1) Straight or solid stream, applied in an unbroken pattern directly to burning fuels, where compartment/room is unvented opposite the attack line

(2) O, T, Z, or ~~N~~ ∩ pattern applied from furthest distance if compartment/room has vent opposite attack line

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Mar 26 14:24:41 EDT 2019

Committee Statement

Committee Statement: Uppercase Omega better represents the nozzle pattern to be followed than N.

Response Message: SR-57-NFPA 1700-2019

Second Revision No. 9-NFPA 1700-2019 [Section No. 10.5.6.5]

10.5.5.5 Alternative Technique.

~~An indirect attack is an alternative technique. Switching to a water spray may improve coverage and reduce water damage.~~ The following are techniques for direct fire control:

(1) An indirect attack. ~~is an alternative technique~~

(2) Switching to a ~~water spray~~ fog pattern may improve coverage and reduce water damage.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Wed Mar 20 15:04:36 EDT 2019

Committee Statement

Committee Statement: The TC views this section as an alternative technique, and not the primary objective. Section is reformatted for clarity.

Response Message: SR-9-NFPA 1700-2019

Public Comment No. 59-NFPA 1700-2018 [Section No. 10.5.6.5]

Second Revision No. 67-NFPA 1700-2019 [Section No. 10.5.7.1]

10.5.6.1 Tactical Objective.

The primary tactical objective is fire suppression to improve tenability for follow-up ~~direct attack~~ fire control and overhaul.

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Tue Apr 02 07:11:39 EDT 2019

Committee Statement

Committee Statement: direct attack replaced with fire control
Response Message: SR-67-NFPA 1700-2019

Second Revision No. 68-NFPA 1700-2019 [Section No. 10.6.2.6]

10.6.2.6 Safety Considerations.

The following are safety considerations:

(1) Interior ~~attack~~ fire control crew must be consulted prior to any tactical ventilation.

(2) Anticipate rapid fire development if ventilation is increased absent the application of water for both planned and unplanned ventilation.

(3) Wind speed and direction is in relation to position and potential flow path.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Apr 02 07:17:59 EDT 2019

Committee Statement

Committee Statement: attack replaced with fire control

Response Message: SR-68-NFPA 1700-2019

Second Revision No. 69-NFPA 1700-2019 [Section No. 10.6.3.1]

10.6.3.1 Tactical Objective.

The primary tactical objective is to improve interior tenability by releasing smoke and heat during the fire ~~attack~~ control and to support search, extinguishment, overhaul, and post-fire ventilation.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Apr 02 07:19:43 EDT 2019

Committee Statement

Committee Statement: The committee replaced attack with control.

Response Message: SR-69-NFPA 1700-2019

Second Revision No. 70-NFPA 1700-2019 [Section No. 10.6.3.3]

10.6.3.3 Tactical Considerations.

The following are tactical considerations for horizontal ventilation:

(1) Coordinated inlet and outlet openings concurrent with effective application of water

(2) Survivability profile in the fire room

(3) Smoke or surface cooling prior to ~~direct attack~~ fire control may be appropriate

(4) Purposeful management of the flow path considering wind direction

(5) Thermal imaging to source fire and monitor changing conditions.

(6) Plan for exposure control

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Apr 02 07:30:18 EDT 2019

Committee Statement

Committee Statement: Tactical considerations are resorted with direct attack replaced with fire control.

Response Message: SR-70-NFPA 1700-2019

Second Revision No. 6-NFPA 1700-2019 [Section No. 10.6.4.2]

10.6.4.2 How It Works.

The following are examples of successful outcomes of ~~horizontal ventilation~~ vertical ventilation :

(1) Buoyant smoke is replaced by denser fresh air due to the gravity current and/or air pressure differentials.

(2) Buoyant smoke is exhausted from an opening located above the level of fire utilizing the stack effect, and denser fresh air is entrained via a horizontal inlet(s) due to the gravity current and/or air pressure differentials.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Wed Mar 20 14:14:59 EDT 2019

Committee Statement

Committee Statement: This section is about vertical ventilation, not horizontal ventilation.

Response Message: SR-6-NFPA 1700-2019

Public Comment No. 18-NFPA 1700-2018 [Section No. 10.6.4.2]

Second Revision No. 71-NFPA 1700-2019 [Section No. 10.6.4.3]

10.6.4.3 Tactical Considerations.

The following are tactical considerations for vertical ventilation:

(1) Coordinated inlet and outlet openings concurrent with effective application of water.
(2) Survivability profile in the fire room/compartment.
(3) Inability to horizontally ventilate.
(4) Smoke cooling prior to ~~a direct~~ fire control or indirect attack may be appropriate.
(5) Purposeful management of the flow path considering wind, wind speed, and direction.
(6) Raising of interface layer height and visibility will be temporary if fire is not controlled.
(7) Thermal imaging to source fire and monitor changing conditions.
(8) Plan for exposure control.
(9) Delays due to staffing, assembly time, or equipment.
(10) A 4 ft × 4 ft (1.22 m × 1.22 m) hole is rarely sufficient for effective ventilation.

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Tue Apr 02 07:50:30 EDT 2019

Committee Statement

Committee Statement: tactical considerations are resorted.
Response Message: SR-71-NFPA 1700-2019

Second Revision No. 72-NFPA 1700-2019 [Section No. 10.6.4.4]

10.6.4.4 Preferred Technique.

The following are preferred techniques for vertical ventilation:

(1) Door control and limited inlet ventilation until vertical outlet is established.

(2) Inlet opening is on the windward side and outlet is above or close to the source fire.

(3) Establish outlet openings followed by inlet openings coordinated with fire ~~attack~~ control .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Apr 02 07:57:08 EDT 2019

Committee Statement

Committee Statement: The committee determined that control is a more appropriate term than attack.

Response Message: SR-72-NFPA 1700-2019

Second Revision No. 73-NFPA 1700-2019 [Section No. 10.6.5.4]

10.6.5.4 Preferred Technique.

Exhaust ventilation should be established prior to mechanical ventilation at the inlet. The exhaust should be larger than the inlet. Interior advancement techniques can be used as appropriate, followed up by ~~timely direct fire attack~~ timely fire control .

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Tue Apr 02 08:01:51 EDT 2019

Committee Statement

Committee Statement: direct fire attack replaced with fire control
Response Message: SR-73-NFPA 1700-2019

Second Revision No. 74-NFPA 1700-2019 [Section No. 10.6.8.3]

10.6.8.3 Tactical Considerations.

The following are tactical considerations for hydraulic ventilation:

(1) Check if ventilation can be done safely post-fire utilizing the ~~attack~~ fire control hose line.

(2) Evaluate optimal position, nozzle pattern, and technique to maximize air entrainment/movement.

(3) Observe the movement of smoke and adjust position for best ventilation effect.

(4) Check surroundings for rekindling or adverse effects.

(5) Check for exterior consequences of stream application.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Apr 02 08:03:22 EDT 2019

Committee Statement

Committee Statement: the committee determined to that fire control is the more appropriate term than attack.

Response Message: SR-74-NFPA 1700-2019

Second Revision No. 75-NFPA 1700-2019 [Section No. 10.6.8.5]

10.6.8.5 Alternative Technique.

An alternative technique is a straight stream or straight bore nozzle pattern with positioning furthest from the opening as possible with a rapid consistent O, T, Z, or ᴎ ∩ pattern to maximize air movement.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Apr 02 08:07:47 EDT 2019

Committee Statement

Committee Statement: Upper case N pattern replace with a upper case Omega character to represent a upside down U pattern.

Response Message: SR-75-NFPA 1700-2019

Second Revision No. 7-NFPA 1700-2019 [Section No. 11.13.2.2]

11.13.2.2 Dry Decontamination.

Techniques that do not wet the PPE may be employed depending on the level of contamination, environmental conditions (particularly cold conditions), and materials available on scene. Dry brushing and air-based brushing methods have been proposed as means to remove the toxic products of combustions from the fire fighters. The following are considerations for dry decontamination:

(1) If wet decontamination is not an option, dry decontamination should be performed prior to the fire fighter doffing PPE unless there is a medical condition needing immediate attention or other emergency such as running out of air. Specifically, consider the impact of environmental conditions as well as the potential for the breathing of airborne contaminants and cross-contamination of exposed skin.

(2) ~~Personnel should initiate off-gassing procedures indicated~~ When feasible, personnel should allow PPE to off-gas as described in 11.5.4 prior to bagging their gear for the return to the station.

(3) All fire fighters engaged in suppression activities, overhaul, or exposure to smoke should exchange their contaminated hoods and gloves after exiting the immediately dangerous to life and health (IDLH) environment.

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Wed Mar 20 14:48:52 EDT 2019

Committee Statement

Committee Statement: Clarifying language. The term 'off gassing procedure' is not used and misleading.
Response Message: SR-7-NFPA 1700-2019

Public Comment No. 62-NFPA 1700-2018 [Section No. 11.13.2.2]

Second Revision No. 36-NFPA 1700-2019 [Section No. 12.5.3]

12.5.3

~~An interior fire control and primary search should be implemented as soon as the visible fire is controlled~~ The incident commander should consider the extent and location of fire involvement prior to the commencement of a primary search .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Sun Mar 24 20:28:52 EDT 2019

Committee Statement

Committee Statement: The committee recognizes the IC may need to consider the location and extent of the fire in determining search operations.

Response Message: SR-36-NFPA 1700-2019

Public Comment No. 4-NFPA 1700-2018 [Section No. 12.5.3]

Second Revision No. 48-NFPA 1700-2019 [Section No. 12.9.7]

12.9.7

Large open areas include long spans typically using lightweight truss construction. These structural characteristics can lead to early structural failure, primarily roof and floor collapse. ~~For the reasons mentioned, vertical ventilation should not be utilized due to the potential for early collapse.~~ Incident commanders should thoroughly consider the risks and benefits before assigning crews to perform roof operations such as vertical ventilation.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Mar 26 09:43:47 EDT 2019

Committee Statement

Committee Statement: One sentence removed due to conflicting guidance.

Response Message: SR-48-NFPA 1700-2019

Public Comment No. 63-NFPA 1700-2018 [Section No. 12.9.7]

Second Revision No. 76-NFPA 1700-2019 [Section No. 12.11.1.3]

12.11.1.3 Evacuation.

The difference between rescue and evacuation must be clear. The evacuation of residents is those that are not in immediate danger. Evacuation of residents not in the immediate fire area may not be an initial priority. Sheltering residents in place may be the most practical method of protection until fire ~~attack~~ control is complete and additional resources are on scene.

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Tue Apr 02 08:31:37 EDT 2019

Committee Statement

Committee Statement: The committee determined that fire control is a more appropriate term than attack.
Response Message: SR-76-NFPA 1700-2019

Second Revision No. 49-NFPA 1700-2019 [Section No. 12.11.3]

12.11.3

~~An interior attack and primary search should be implemented as soon as the visible fire is controlled~~ The incident commander should consider the extent and location of fire involvement prior to the commencement of interior fire control and primary search .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Mar 26 09:46:48 EDT 2019

Committee Statement

Committee Statement: The TC change allows the incident commander to consider location and extent of fire in determining fire control and search operations.

Response Message: SR-49-NFPA 1700-2019

Public Comment No. 13-NFPA 1700-2018 [Section No. 12.11.3]

Public Comment No. 6-NFPA 1700-2018 [Section No. 12.11.3]

Second Revision No. 37-NFPA 1700-2019 [Section No. 12.13]

12.13 Abandoned and Vacant Structures.

Abandoned ~~and~~ or vacant structures are buildings that are no longer in use, and in many cases are in an unknown state of condition or compromise, which could result in weakened structural components, holes in floors, and structural deficiencies. The following should be considered when controlling fires in these structures:

(1) ~~An exterior~~ Exterior fire control should be ~~used to control the fire~~ considered prior to entry.

(2) Early collapse should be anticipated.

(3) Gutted, deteriorated, and modified interiors can result in unpredictable and increased fire activity. These conditions may impede normal fire-fighting operations.

(4) ~~Reports of~~ Occupancy by squatters and transients should be ~~verified before rescue operations are~~ considered. As such, an evaluation of occupant survivability and rescue potential should be made.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Sun Mar 24 20:36:34 EDT 2019

Committee Statement

Committee Statement: The Committee determined that consideration for rescue operations should not be delayed until after verification of squatters and transients.

Response Message: SR-37-NFPA 1700-2019

Public Comment No. 64-NFPA 1700-2018 [Section No. 12.13]

Public Comment No. 15-NFPA 1700-2018 [Section No. 12.13]

Public Comment No. 7-NFPA 1700-2018 [Section No. 12.13]

Second Revision No. 38-NFPA 1700-2019 [Section No. 12.15.1]

12.15.1

Key risk factors for warehouse fires include the following:

(1) Construction features including construction type, total building size, details of fire-rated enclosures, and the presence of large open fire areas

(2) The types and hazard level of material stored

(3) Details on the storage configurations such as height and type (e.g., rack storage, floor storage~~.~~)

(4) Presence, type, and suitability of fire protection and detection systems

(5) Any available methods to facilitate ventilation such as roof vents, ~~and~~ smoke control, and exhaust systems

(6) Available water supply sources and adequacy

(7) Equipment and machines related to material handling

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Sun Mar 24 20:40:24 EDT 2019

Committee Statement

Committee Statement: The committee added material handling equipment that can also cause fires and hazards, Whether it is recharging stations for batteries or propane cylinders.

Response Message: SR-38-NFPA 1700-2019

Public Comment No. 9-NFPA 1700-2018 [Section No. 12.15.1]

Second Revision No. 39-NFPA 1700-2019 [Section No. 12.19.1]

12.19.1

A thermal imager can be utilized on the exterior to assess the ~~temperature of~~ thermal conditions at windows, vents, and doorways to assess the potential for a fire within the basement. It should be noted that thermal imagers cannot ~~see temperature through concrete or masonry walls~~ see through walls or barriers, only the thermal conditions at the material's surface .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Sun Mar 24 20:44:30 EDT 2019

Committee Statement

Committee Statement: The committee changed temperature to thermal condition, Thermal imagers cannot see temperatures, only see the thermal conditions from heated surfaces.

Response Message: SR-39-NFPA 1700-2019

Public Comment No. 10-NFPA 1700-2018 [Section No. 12.19.1]

Second Revision No. 40-NFPA 1700-2019 [Section No. 12.20.4]

12.20.4

~~The rear of these~~ These structures usually ~~has~~ have no windows~~,~~ ~~and~~ only doors, in the rear . The rear doors ~~need to~~ should be forced open early in the incident to create a ventilation flow path and to provide a means of egress for occupants. Door control should be implemented so that ventilation may be coordinated with water application .

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Sun Mar 24 20:51:47 EDT 2019

Committee Statement

Committee Statement: The committee recognizes the need for providing a secondary means of escape along with a controllable ventilation flow path.

Response Message: SR-40-NFPA 1700-2019

Public Comment No. 11-NFPA 1700-2018 [Section No. 12.20.4]

Public Comment No. 65-NFPA 1700-2018 [Section No. 12.20.4]

Second Revision No. 18-NFPA 1700-2019 [Section No. A.3.3.96.3]

A.3.3.99.3 Hot Zone.

For a structure fire, the structure is part of the hot zone, regardless of what can be seen from the outside.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Thu Mar 21 11:56:02 EDT 2019

Committee Statement

Committee Statement: The determination of the "hot zone" in a structure fire should start with the structure, but not necessarily be limited to this area. Current appendix information appears to be unnecessarily limiting.

Response Message: SR-18-NFPA 1700-2019

Public Comment No. 67-NFPA 1700-2018 [Section No. A.3.3.96.3]

Second Revision No. 1-NFPA 1700-2019 [Section No. D.1.1]

D.1.1 NFPA Publications. ~~(Reserved)~~

NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments,* 2020 edition.

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Fri Mar 15 08:14:54 EDT 2019

Committee Statement

Committee Statement: NFPA 1710 referenced in A.12.10
Response Message: SR-1-NFPA 1700-2019

Second Revision No. 3-NFPA 1700-2019 [New Section after D.1.2.2]

D.1.2.2 NFFF Publications.

National Fallen Firefighters Foundation, P.O. Drawer 498, Emmitsburg, MD 21727.

"16 Firefighter Life Safety Initiatives," 2004.

Submitter Information Verification

Committee: FCO-AAA
Submittal Date: Fri Mar 15 08:33:17 EDT 2019

Committee Statement

Committee Statement: Added for New NFFF Annex.
Response Message: SR-3-NFPA 1700-2019

Second Revision No. 78-NFPA 1700-2019 [Section No. D.1.2.2]

D.1.2.3 Other Publications.

Duncan, Michael D; Littau, Sally R; Kurzius-Spencer, Margaret; Burgess, Jefferey L., “Development of Best Practice Standard Operating Procedures for Prevention of Fireground Injuries,” *Fire Technology;* Norwell Vol. 50, Issue 5, Springer Science & Business Media, September 2014.

Everett M. Rogers, *Diffusion of Innovations*, Fifth Edition, Free Press, New York, 2003.

Fire Protection Research Foundation, *Development of Emergency Responder SOPs/SOGs Using Crowdsourcing to Address Electrical Vehicle Fires*, Quincy MA, 2014.

~~Madrzykowski, *Daniel and Weinschenk Craig,* *Understanding and Fighting Basement Fires* , UL Firefighter Safety Research Institute, Columbia, MD, March 27, 2018.~~

United States Fire Administration, *Guide to Developing Effective Standard Operating Procedures for Fire and EMS Departments*, FA-197, Emmitsburg, MD: Department of Homeland Security, Federal Emergency Management Agency, 1999.

Submitter Information Verification

Committee: FCO-AAA

Submittal Date: Tue Apr 23 12:01:54 EDT 2019

Committee Statement

Committee Statement: Relocated "Madrzykowski, Daniel and Weinschenk Craig, Understanding and Fighting Basement Fires, UL Firefighter Safety Research Institute, Columbia, MD, March 27, 2018" to section D.2

Response Message: SR-78-NFPA 1700-2019

Second Revision No. 79-NFPA 1700-2019 [Section No. D.2.6]

D.2.6 Other Publications.

Colburn, D, et al., “A Comparison of Cooling Techniques in Firefighters After a Live Burn Evolution,” *Prehosp Emerg Care,* 15(2), 2011.

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D.2.7 Internet References.

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