Flow Path — Composed of at least one inlet opening, one exhaust opening, and the connecting volume between the openings. The direction of the flow is determined by difference in pressure. Heat and smoke in a high-pressure area will flow through openings toward areas of lower pressure.

Statement of Problem and Substantiation for Public Comment

This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.

Related Public Comments for This Document

Related Comment

Public Comment No. 15-NFPA 1403-2015 [Section No. 4.3.2.4]

Related Item

Public Input No. 22-NFPA 1403-2014 [Section No. 4.3]

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
Organization: National Institute of Standard
Street Address:
City:
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Submittal Date: Mon Nov 16 12:01:30 EST 2015

Committee Statement

Committee Action: Rejected but see related SR
Statement: This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.
Public Comment No. 5-NFPA 1403-2015 [Section No. 3.3.15]

3.3.15 Instructor.
An individual qualified by the authority having jurisdiction to deliver fire-fighter training, who has the training and experience to supervise students during live fire training evolutions and shall meet the requirements of an Instructor I in accordance with NFPA 1041 Standard for Fire Service Instructor Professional Qualifications.

Statement of Problem and Substantiation for Public Comment

This recommended change will more closely align with the knowledge, skills, and abilities required of a person filling this role in accordance with NFPA 1041.

Related Item
Public Input No. 33-NFPA 1403-2015 [New Section after 9.1.4]

Submitter Information Verification

Submitter Full Name: Derrick Clouston
Organization: North Carolina Department of I
Street Address:
City:
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Zip:
Submittal Date: Wed Oct 21 09:32:04 EDT 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-2-NFPA 1403-2016
Statement: This recommended change will more closely align with the knowledge, skills, and abilities required of a person filling this role in accordance with NFPA 1041.
3.3.16 Instructor-in-Charge.

An individual qualified as an instructor and designated by the authority having jurisdiction to be in charge of the live fire training evolution and shall meet the requirements as an Instructor II in accordance with NFPA Standard for Fire Service Instructor Professional Qualifications.

Statement of Problem and Substantiation for Public Comment

This modification of the definition will more closely align the requirements for the Instructor-in-Charge with NFPA 1041 and the knowledge, skills, and abilities needed by an instructor filling this role.

Related Item
Public Input No. 33-NFPA 1403-2015 [New Section after 9.1.4]

Submitter Information Verification

Submitter Full Name: Derrick Clouston
Organization: North Carolina Department of I
Street Address:
City:
State:
Zip:
Submittal Date: Wed Oct 21 09:26:48 EDT 2015

Committee Statement

Committee: Rejected but see related SR
Action:
Resolution: SR-3-NFPA 1403-2016
Statement: This modification of the definition will more closely align the requirements for the Instructor-in-Charge with NFPA 1041 and the knowledge, skills, and abilities needed by an instructor filling this role.
4.3.2 Prerequisites for Live Fire Training Participants. Change "Participants" to Fire service and industrial based students.

Prior to being permitted to participate in live fire training evolutions, all participants shall have received training to meet the requirements in accordance with 4.3.2.1 through 4.3.2.7.

4.3.2.1 Introductory Live Fire Training.
All participants shall be given classroom training for the following skills:

1. Recognizing the need for an in-depth theoretical and practical knowledge of fire behavior for safe fire suppression operations
2. Understanding the underlying concept of compartment fire behavior training as a basis for safe fire suppression operations

4.3.2.2 Health and Safety.
All participants shall be given classroom training for the following skills:

1. Recognizing the physiological stress that results from working in protective clothing and SCBA in a high temperature environment
2. Understanding the rationale and need for medical monitoring during physiologically stressful training operations

4.3.2.3 Fundamentals of Fire Behavior.
All participants shall be given classroom training for the following skills:

1. Describing the basic chemical and physical processes involved in combustion
2. Explaining fire phenomena using the fire triangle and tetrahedron as simple models of combustion
3. Explaining basic concepts of thermal dynamics, including thermal energy, temperature, and methods of heat transfer
4. Describing the combustion process for gaseous, liquid, and solid fuels
5. Explaining the concepts of heat of combustion and heat release rate
6. Describing the influence of the fuel/oxygen mixture on combustion
7. Explaining the concept of chemical chain reaction as it relates to flaming combustion
8. Recognizing characteristics of common types of combustion products
9. Using terminology related to combustion and fire dynamics
4.3.2.4  Fire Development in a Compartment.

All participants shall be given classroom training for the following skills:

(1) Describing the general development of a fire and extension beyond a single room or compartment, including heat transfer methods, pressurization within the space, stages of fire development and transition from fuel controlled to ventilation controlled combustion

(2) Identifying building factors influencing fire development

(3) Explaining the concepts of fire load and ventilation profile

(4) Explaining the significance of the transition from a contents fire to a structural fire

(5) Using terminology related to fire development, including plume, ceiling jet, hot gas layer, neutral plane, air track and gravity current

(6) Explaining the impact of the following factors on fire development in a compartment:

    (7) Type of fuel
    (8) Availability and locations of additional fuel
    (9) Volume of the compartment
    (10) Ceiling height and size, number, and arrangement of ventilation openings
    (11) Thermal properties of the enclosure (insulation)

4.3.2.5  Nozzle Techniques and Door Entry.

All participants shall be given classroom and hands-on training for the following skills:

(1) Identifying and describing factors influencing the effectiveness of extinguishment by cooling

(2) Describing the application of indirect attack, direct attack, and 3D gas cooling

(3) Demonstrating the nozzle techniques for pulsing, penciling, and painting

(4) Recognizing key door entry size-up and dynamic risk assessment factors

(5) Understanding how integrated door control and gas cooling reduce the risk of extreme fire behavior during door entry

(6) Demonstrating effective door entry procedures
4.3.2.6 Extreme Fire Behavior (Classroom).

All participants shall be given classroom and hands-on training for the following skills:

1. Recognizing the hazards presented by extreme fire behavior
2. Explaining how the following three extreme fire behavior phenomena occur:

   3. Flashover
   4. Backdraft
   5. Smoke explosion

3. Explaining the influence of changes in ventilation profile in each of the following burning regimes:

   7. Fuel-controlled
   8. Ventilation-controlled

4. Differentiating between ventilation, unplanned ventilation, tactical ventilation, and tactical anti-ventilation.

5. Recognizing the significance of fire behavior indicators in each of the following categories:

   11. Building
   12. Smoke
   13. Air track
   14. Heat
   15. Flame
4.3.2.7 Observation of Live Fire Behavior.

Prior to participating in a live fire evolution, all participants shall be required to observe fire behavior in a controlled environment and shall demonstrate the following skills:

1. Describing anticipated fire behavior based on conditions experienced inside a compartment under actual fire conditions
2. Using visual observation under actual fire conditions to identify evidence of pyrolysis, neutral plane, air track, and rollover
3. Demonstrating the following nozzle techniques under actual fire conditions:
   - Pulsing (short pulse)
   - Penciling
   - Painting

Statement of Problem and Substantiation for Public Comment

As currently written the standard requires all participants to be trained in a host of topics related to fire attack. At the Massachusetts Firefighting Academy we train two groups of student 1) the prospective firefighter "Recruit" and or current firefighters paid, on-call or volunteer. I completely understand the baseline requirements for this group of students. However our other group, 2) Industry based students, Mariners, gas service workers, propane delivery staff, etc. The Standard as written would require us to teach a student looking for basic fire extinguisher skills to learn ventilation, ground ladders and others subjects that will never help them with a fire extinguisher. I understand the need to teach fire behavior and extinguisher basic knowledge but the other topics are simply over kill. It would be like a waitress wanting to learn CPR and we tell her she must take an EMT course. I believe that 4.3.2 should break down into two groups of students those being 1) Firefighters and prospective Firefighters and 2) Industrial students outside the fire service. As currently written it doesn't give an option to provide for this training. The answer is either meet the standard and teach subjects like ladders and ventilation to students that they will never use or ignore the standard. Another part to a solution might be to add this to the definitions section. Define each group of students, 1) Firefighting 2) Industrial.

Related Item
First Revision No. 3-NFPA 1403-2015 [Section No. 4.3]

Submitter Information Verification

Submitter Full Name: John Boland
Organization: Massachusetts Fire Academy
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Mon Oct 19 15:13:29 EDT 2015

Committee Statement
Committee: Rejected
Action:
Resolution: Training requirements for Industrial Fire Brigade members are covered by NFPA 1081 Standard for Industrial Fire Brigade Member Professional Qualifications and NFPA 600 Standard on Facility Fire Brigades. 1081- NFPA 1403 is not referenced. Ch 5 Incipient Fire Fighting NO PPE, Ch 6 Advanced Exterior or Interior Structural Fire Fighting, Full PPE & SCBA, Ch 7. Interior Structural Fire Fighting, knowledge of ventilation & suppression. 600- 1403 is referenced. Ch 5 Incipient Fire Fighting NO PPE, Ch 6 Advanced Exterior and Interior Firefighting – Full PPE and SCBA and Live Fire per 1403. Therefore 1403 is only applicable to Industrial Fire Brigade members that are going to perform Advanced Firefighting requiring knowledge of PPE, fire behavior, structural ventilation and suppression.
Public Comment No. 13-NFPA 1403-2015 [ Section No. 4.3.2.1 ]

4.3.2.1—Introductory—Live— Fire Training Dynamics.

All participants shall be given classroom training for the following skills:

1. Recognizing the need for an in-depth theoretical and practical knowledge of fire behavior for safe fire suppression operations
   Understanding the underlying concept of compartment fire behavior training as a basis for safe fire suppression operations

2. Company members shall be able to describe the components of fire and definition of a fire.

3. Company members shall be able to describe the conditions necessary for flashover to occur.

4. Company members shall be able to describe the three mechanisms of heat transfer — conduction, convection, radiation.

Statement of Problem and Substantiation for Public Comment

This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.

Related Item

Public Input No. 22-NFPA 1403-2014 [Section No. 4.3]

Submitter Information Verification

Submitter Full Name: Daniel Madzykowski
Organization: National Institute of Standard
Street Address:
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Submittal Date: Mon Nov 16 11:05:52 EST 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-4-NFPA 1403-2016
Statement: This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.
Public Comment No. 14-NFPA 1403-2015 [Section No. 4.3.2.2]

4.3.2.2 Health and Safety.
All participants shall be given classroom training for the following skills:

(1) Recognizing the physiological stress that results from working in protective clothing and SCBA in a high temperature environment
   Understanding the rationale and need for medical monitoring during physiologically stressful training operations

(2) Company members shall be able to describe the components of their protective clothing and equipment required for use during operational evolutions.

(3) Company members shall be able to describe the capabilities and limitations of their protective clothing and equipment based on the following.

Statement of Problem and Substantiation for Public Comment

This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.

Related Item
Public Input No. 22-NFPA 1403-2014 [Section No. 4.3]

Submitter Information Verification

Submitter Full Name: Daniel Madrykowski
Organization: National Institute of Standards
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Submittal Date: Mon Nov 16 11:11:58 EST 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-5-NFPA 1403-2016
Statement: This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.
4.3.2.4 Fire Development in a Compartment.

All participants shall be given classroom training for the following skills:

1. Describing the general development of a fire and extension beyond a single room or compartment, including heat transfer methods, pressurization within the space, stages of fire development and transition from fuel controlled to ventilation controlled combustion.

2. Identifying building factors influencing fire development.

3. Explaining the concepts of fire load and ventilation profile. Company members shall be able to describe the stage of fire growth for fuel-limited fire.

4. Company members shall be able to describe the stages of fire growth for a ventilation-limited fire.

5. Explaining the significance of the transition from a contents fire to a structural fire.

6. Using terminology related to fire development, including plume, ceiling jet, hot gas layer, neutral plane, air-track and flow path, and gravity current.

7. Explaining the impact of the following factors on fire development in a compartment:
   a. Type of fuel
   b. Availability and locations of additional fuel
   c. Volume of the compartment
   d. Ceiling height and size, number, and arrangement of ventilation openings
   e. Thermal properties of the enclosure (insulation).

***For CH 3, definition section

Flow Path — Composed of at least one inlet opening, one exhaust opening, and the connecting volume between the openings. The direction of the flow is determined by difference in pressure. Heat and smoke in a high-pressure area will flow through openings toward areas of lower pressure.

7. Recognizing the hazards presented by fire behavior that impacts a singular and/or multiple compartments.

8. Explaining how the following three fire behavior phenomena occur:
   a. Flashover
   b. Backdraft
   c. Smoke explosion

9. Explaining the influence of changes in ventilation in each of the following burning regimes:
   a. Fuel-controlled
   b. Ventilation-controlled

10. Differentiating between ventilation, unplanned ventilation, tactical ventilation, and tactical anti-ventilation.

11. Recognizing the significance of fire behavior indicators in each of the following...
Statement of Problem and Substantiation for Public Comment

This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.

Related Public Comments for This Document

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<td>Public Comment No. 26-NFPA 1403-2015 [New Section after 3.3.11]</td>
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Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski  
Organization: National Institute of Standard

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-6-NFPA 1403-2016
Statement: This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.
Public Comment No. 16-NFPA 1403-2015 [Section No. 4.3.2.5]

4.3.2.5 Nozzle Techniques and Door Entry Control.
All participants shall be given classroom and hands-on training for the following skills:

1. Identifying and describing factors influencing the effectiveness of extinguishment by cooling.
2. Describing the application of indirect attack and direct attack and 3D-gas cooling.
3. Demonstrating the nozzle techniques for pulsing, pencilling, and painting.
4. Recognizing key door entry size-up and dynamic risk assessment factors.
5. Understanding how integrated door control and gas cooling reduce the risk of extreme fire behavior during door entry.
6. Demonstrating effective door entry and control procedures.

Statement of Problem and Substantiation for Public Comment

This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.

Related Item
Public Input No. 22-NFPA 1403-2014 [Section No. 4.3]

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
Organization: National Institute of Standard
Street Address:
City:
State:
Zip:
Submittal Date: Mon Nov 16 11:26:00 EST 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-7-NFPA 1403-2016
Statement: This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.
Delete all of 4.3.2.6 — Extreme Fire Behavior - (Classroom).

All participants shall be given classroom and hands-on training for the following skills:

1. Recognizing the hazards presented by extreme fire behavior
2. Explaining how the following three extreme fire behavior phenomena occur:
   3. Flashever
   4. Backdraft
   5. Smoke explosion
3. Explaining the influence of changes in ventilation profile in each of the following burning regimes:
   7. Fuel-controlled
   8. Ventilation-controlled
4. Differentiating between ventilation, unplanned ventilation, tactical ventilation, and tactical anti-ventilation.
5. Recognizing the significance of fire behavior indicators in each of the following categories:
   11. Building
   12. Smoke
   13. Air track
   14. Heat
   15. Flame

Statement of Problem and Substantiation for Public Comment

This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment. Topics are covered in revised sections of the chapter. Term "extreme fire behavior" is not being widely used as conditions like flashover are predictable to a degree and are not extreme.
Related Item
Public Input No. 22-NFPA 1403-2014 [Section No. 4.3]

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
Organization: National Institute of Standard
Street Address:
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Submittal Date: Mon Nov 16 11:41:25 EST 2015

Committee Statement

Committee Action: Accepted
Resolution: SR-8-NFPA 1403-2016
Statement: This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.

Topics are covered in revised sections of the chapter. Term "extreme fire behavior" is not being widely used as conditions like flashover are predictable to a degree and are not extreme.
Delete all of 4.3.2.7 Observation of Live Fire Behavior.

Prior to participating in a live-fire evolution, all participants shall be required to observe fire behavior in a controlled environment and shall demonstrate the following skills:

1. Describing anticipated fire behavior based on conditions experienced inside a compartment under actual fire conditions
2. Using visual observation under actual fire conditions to identify evidence of pyrolysis, neutral plane, air track, and rollover
3. Demonstrating the following nozzle techniques under actual fire conditions:
   4. Pulsing (short-pulse)
   5. Penciling
   6. Painting

Statement of Problem and Substantiation for Public Comment

This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.

Related Item
Public Input No. 22-NFPA 1403-2014 [Section No. 4.3]

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
Organization: National Institute of Standard
Street Address:
City:
State:
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Submittal Date: Mon Nov 16 11:42:36 EST 2015

Committee Statement

Committee Accepted
Action:
Resolution: SR-9-NFPA 1403-2016
Statement: This comment is an output of the Ch 4 Task Group to address the need to improve
the fire dynamics knowledge of the students while providing a controlled training environment.

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Public Comment No. 7-NFPA 1403-2015 [ New Section after 4.4 ]

**TITLE OF NEW CONTENT**

Type your content here … See later screen for proposed revised wording to my previous Public Input #23.

**Additional Proposed Changes**

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**Statement of Problem and Substantiation for Public Comment**

Research references has been included in the submission.

**Related Item**

Public Input No. 23-NFPA 1403-2014 [New Section after 4.4.4]

**Submitter Information Verification**

- **Submitter Full Name:** William Peterson
- **Organization:** [ Not Specified ]
- **Affiliation:** International Fire Marshals Association
- **Street Address:**
- **City:**
- **State:**
- **Zip:**
- **Submittal Date:** Wed Oct 28 10:15:29 EDT 2015

**Committee Statement**

- **Committee Action:** Rejected but see related SR
- **Resolution:** SR-24-NFPA 1403-2016
- **Statement:** The Technical Committee added these sections as more documentation is becoming available on the physiological impact on participants of live fire training activities. A 2006 study conducted by the Swedish Fire Service on the physiological effects of working in a hyperthermic environment was referenced for these sections.
New 4.4 Participant Health and Safety (renumber existing sections 4.4 to 4.16)

4.4.1 Participants engaged in strenuous physical activity during live fire training shall be limited to a maximum of four (4) sessions, or evolutions, of a duration of a maximum of 20 minutes each, in a hyperthermic high temperature environment per day.

4.4.1.1* A high temperature environment shall be considered to be weather conditions that result in a Temperature Humidity Index (THI or Heat Index) of more than 90 degrees F (32 degrees C).

A.4.4.1.1 NOAA (National Weather Service) Temperature Humidity Index Chart

4.4.2* Participants participation in live fire training sessions (evolutions) in a hyperthermic high temperature environment shall be given a period of rest, after each session or evolution, to allow for proper rehydration and reduction of core body temperatures to normal levels in compliance with Chapter 6 of NFPA 1584: Standard on the Rehabilitation Process for Members During Emergency Operations and Training Exercises.

A.4.4.2 Consideration should be given to the accumulated physiological effects on each participant when working in a hyperthermic high temperature environment. If the work in
hyperthermic high temperature environment is highly physically demanding, at very high temperatur es heat index values greater than 102 degrees F, or if other circumstances apply, rest periods should be longer.

4.4.3* Participants in live fire training sessions (evolutions) shall not be required to work in a hypothermic high temperature environment on consecutive days when the heat index is greater than 102 degrees F.

A.4.4.3 International study data, conducted both in the United States and United Kingdom, on the physiological effects of live fire training on fire fighters tend to indicate that in a longer perspective, frequent exposure to high temperature environments, can result in health risks to participants engaged in live fire training.

4.4.4* Live fire training sessions (evolutions) consisting of strenuous physical activity shall not be monitored and not exceed 20 minutes a maximum of one (1) hour in duration, under any circumstances.

A.4.4.4 Further guidance and information may be obtained in "Health and Safety Guidelines for Fire Fighter Training", University of Maryland, Center for Fire fighter Safety Research and Development, Maryland Fire and Rescue Institute, College Park, Maryland.

4.4.5 Live fire training sessions (evolutions) shall not exceed thirty (30) minutes in duration when the outside air temperature exceeds 30° C (86° F), and the outdoor relative humidity exceeds 80%.

4.4.6* The times in 4.4.4 and 4.4.5 shall be reduced if the nature of the live fire evolution requires the participant to engage in highly physically demanding activity.

*A.4.4.6* When assessing the length and number of a live fire training sessions (evolutions) conducted in a training day, the following should be taken into account:

1. nature of the work to be performed by the participant,
2. physical stress of the work on the participant,
3. temperature of the work and evolution environment
4. exposure time in a hyperthermic high temperature environment, and
5. other circumstances (e.g. weather, humidity heat index).

Statement of Problem and Substantiation for Public Input

More and more documentation is becoming available about the physiological impact on participants of live fire training activities. In 2006, a study was conducted by the Swedish Fire Service on the physiological effects of working in a hyperthermic environment. In connection with the typical training of fire fighters the study involved practical sessions in more or less realistic environments, with smoke-filled exercise facilities where ambient temperature in some
parts were as high as 100 - 150 ° C (212- 302° F) or even higher. The study was managed and supervised by a two interacting instructors. These study participants were repeatedly exposed, to some extent, to hard physical work in a hyperthermic environment, replicating the physiological demands typically encountered in live fire training. Results from the study indicates that the physiological impact of participating in live fire training activities may be harmful, particularly in the long term. The six study participants included five males (22 - 38 years old) and a female, (39 years old). The study was performed over a four day period where participants engaged in live fire training exercises four (4) times each day. Before and after each day, the study participants received a medical examination with blood pressure and ECG recording, respiratory function test, test on reaction speed, memory function and fine motor skills. Blood and urine were also analyzed, as a part of the medical screening process. Skin, rectal, and ambient temperatures were recorded continuously as well as heart rate. Fluid loss and fluid intake were recorded daily. It was found that all individuals who participated in the study exercises had raised their body temperature to between 38-40 ° C (100.4 -104.0° F) during all tests conducted in a hyperthermic environment. The Daily fluid loss of the participants ranged from 2900 - 8600 ml. Five of the six individuals reported fatigue and three of six individuals experienced headaches. All test results, with one exception, show values within what would normally be seen as normal limits. However the study also reveals patterns in the test results that indicate transient changes which could possibly indicate that the studied activity involves a health risk, at least in the currently practiced mode of typical live fire training practices. Study results clearly implied that high physical exertion in a hyperthermic environment can result in ECG changes, effects on blood pressure and heart rate, and changes in several blood parameters (liver enzymes and pancreatic amylase, hemoglobin, white blood cells and platelets, creatinine, blood sugar, metabolism, blood lipids, myoglobin). Also seen in the test results were abnormal influences such as the presence of protein, and in one case both red as white blood cells in collected urine samples. While the study physiological testing and analysis did not indicate any immediate serious health effects, the completed study made observations that would tend to indicate that in a longer perspective, frequent exposure to hyperthermic temperatures, can result in health risks to participants engaged in live fire training. The results of the Sweden study means that it is prudent to limit participant exposure to conditions where they would experience a combination of high physical load and hyperthermic temperatures.
Public Comment No. 6-NFPA 1403-2015 [New Section after 4.6.1]

**Live Fire Instructor**

The Live Fire Instructor shall have received training to meet the minimum job performance requirements for Fire Instructor I in NFPA 1041.

**Statement of Problem and Substantiation for Public Comment**

This change will define the knowledge, skills, and abilities, of a person who is being used to assist the Instructor-in-Charge in the delivery of Live Fire Training and more closely align with NFPA 1041.

**Related Item**

Public Input No. 33-NFPA 1403-2015 [New Section after 9.1.4]

**Submitter Information Verification**

Submitter Full Name: Derrick Clouston  
Organization: North Carolina Department of I  
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Wed Oct 21 09:41:32 EDT 2015

**Committee Statement**

Committee Action: Rejected  
Resolution: The term does not exist in the doc
Public Comment No. 3-NFPA 1403-2015 [Section No. 4.6.1]

4.6.1

The instructor-in-charge shall have received training to meet the minimum job performance requirements for Fire Instructor Ill in NFPA 1041.

Statement of Problem and Substantiation for Public Comment

This modification to the standard will align NFPA 1403 more closely with NFPA 1041 and the knowledge, skills, and abilities required of an Instructor-in-Charge.

Related Item
Public Input No. 33-NFPA 1403-2015 [New Section after 9.1.4]

Submitter Information Verification

Submitter Full Name: Derrick Clouston
Organization: North Carolina Department of I
Street Address:  
City:  
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Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-13-NFPA 1403-2016
Statement: This modification to the standard will align NFPA 1403 more closely with NFPA 1041 and the knowledge, skills, and abilities required of an Instructor-in-Charge.
Public Comment No. 19-NFPA 1403-2015 [Section No. 4.6.5 [Excluding any Sub-Sections]]

The instructor in charge shall ensure all instructors involved in the live fire evolution doff their PPE after each evolution.

The instructor-in-charge shall provide for rest and rehabilitation of participants operating at the scene, including any necessary medical evaluation and treatment, food and fluid replenishment, and relief from climatic conditions. (See Annex D.)

Statement of Problem and Substantiation for Public Comment

This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment and improve the safety of the instructors.

Related Item
Public Input No. 23-NFPA 1403-2014 [New Section after 4.4.4]

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
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Street Address:
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Submittal Date: Mon Nov 16 11:43:53 EST 2015

Committee Statement

Committee Action: Rejected
Resolution: language already in the doc
Public Comment No. 20-NFPA 1403-2015 [Section No. 4.6.5.1]

4.6.5.1 *

Instructors shall be rotated through duty assignments. An instructor shall not serve as the ignition officer for more than one evolution in a row.

Statement of Problem and Substantiation for Public Comment

This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment and improving the safety of the instructors.

Related Item
Public Input No. 23-NFPA 1403-2014 [New Section after 4.4.4]

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
Organization: National Institute of Standard
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City:
State:
Zip:
Submittal Date: Mon Nov 16 11:45:12 EST 2015

Committee Statement

Committee: Accepted
Action:
Resolution: SR-16-NFPA 1403-2016
Statement: This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment and improving the safety of the instructors.
Public Comment No. 21-NFPA 1403-2015 [ New Section after 4.6.12.2 ]

4.6.13 Training Instructors on How to Develop a Ventilation-Controlled Evolution

The instructors and the safety officer responsible for conducting live fire training evolutions with a ventilation-controlled and flow path conditions shall be trained in means to develop the evolutions following the requirements of this standard.

Statement of Problem and Substantiation for Public Comment

This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.

Related Item
Public Input No. 22-NFPA 1403-2014 [Section No. 4.3]

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
Organization: National Institute of Standard
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City: 
State: 
Zip: 
Submittal Date: Mon Nov 16 11:47:04 EST 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-17-NFPA 1403-2016
Statement: This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.
Public Comment No. 22-NFPA 1403-2015 [Section No. 4.12.2]

4.12.2
Pressure-treated wood, rubber, plastic, polyurethane foam, tar paper, upholstered furniture, and carpeting, and chemically treated or pesticide-treated straw or hay shall not be used as part of the fuel load.

Statement of Problem and Substantiation for Public Comment

Added carpet as a common fuel that should not be used in training fires.

Related Item
Public Input No. 31-NFPA 1403-2014 [Section No. 4.12.2]

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
Organization: National Institute of Standard
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City:
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Submittal Date: Mon Nov 16 11:48:33 EST 2015

Committee Statement

Committee: Accepted
Action:
Resolution: SR-18-NFPA 1403-2016
Statement: Added carpet is a common fuel that should not be used in training fires as it contributes to the unintended fuel load. The products of combustion given off by carpet have also been found to be toxic.
Public Comment No. 23-NFPA 1403-2015 [Section No. 4.12.7]

4.12.7
The fuel load shall be limited to avoid conditions that could cause an uncontrolled flashover or backdraft. If flashover is to occur, the additional safety measures for providing a safe observation space for instructors and students shall be documented.

Statement of Problem and Substantiation for Public Comment

This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.

Related Item
Public Input No. 23-NFPA 1403-2014 [New Section after 4.4.4]

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
Organization: National Institute of Standard
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City:
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Submittal Date: Mon Nov 16 11:50:07 EST 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-19-NFPA 1403-2016
Statement: This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.
Public Comment No. 12-NFPA 1403-2015 [Section No. A.1.3.3]

A.1.3.3

This requirement applies specifically to non-gas-fired flashover containers where a flashover is engineered.

Statement of Problem and Substantiation for Public Comment

There should be some concern that this language would be read to exclude non-gas fired flashover containers. The restriction is going to flashover while the students are simply observing. I cannot speak for other flashover courses, but the course offered by Draeger takes it close to a flashover, but not to the full flashover. The course also has hands-on involvement by students so that it is not simply observation. This course is in compliance with the Swedish Fire Rescue Agency national burn behaviour program.

Related Item

First Revision No. 15-NFPA 1403-2015 [New Section after 1.3.2]

Submitter Information Verification

Submitter Full Name: Joseph Drouin
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Submittal Date: Thu Nov 12 09:53:04 EST 2015

Committee Statement

Committee: Rejected but see related SR
Action:
Resolution: SR-10-NFPA 1403-2016
Statement: After reflection this statement would cause more confusion than clarity thus it was struck. Delete associated annex material as well.
A.4.6.11* Monitoring the wind and weather conditions is important for determining the impact of the wind on your live fire evolution. Placing students and instructors downwind of the fire, either inside or outside of the structure may result in exposures to thermal and chemical hazards that in excess of those normally associated with the planned evolution and may result in injury or death.

Statement of Problem and Substantiation for Public Comment

This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.

Related Item

Public Input No. 23-NFPA 1403-2014 [New Section after 4.4.4]

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
Organization: National Institute of Standard
Street Address:
City:
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Submittal Date: Mon Nov 16 11:51:28 EST 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-22-NFPA 1403-2016
Statement: The technical committee added annex language to this section in order to provide additional information. The comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.
A.4.12.7 *

*Operational plan for accomplishing training objectives with a ventilation controlled fire:

(1) Lead instructor will identify fire growth observation area prior to ignition of any live fires. The area shall be out of the flow path and in a designated safe haven area. Student and instructor will have a hoseline in safe haven area that has a fire stream capable of reaching the ignition room.

(2) Hose lines should be deployed and placed in position prior to ignition of fire. The hoseline will be used to control temperature and fire growth from the observation area.

(3) Observation areas should be on the same level or below the level of the fire with direct unimpeded access to exit.

(4) No students or instructors in fire room after ignition.

(5) The identification of potential flow path must be communicated to all students and instructors prior to ignition. Lead instructor will designate flow path.

(6) Ensure that no unidirectional flow paths that exhaust over firefighters are created. If weather or the fire creates an potential hazardous flow path, immediate notification must be made to the interior instructor and removal of personnel from the observation area.

(7) Interior instructor should coordinate ventilation with exterior personnel that will complete ventilation to achieve desired fire affect. Coordination of ventilation will occur after hoseline are placed and operational and all instructors and students are located in safe haven area.

(8) The instructor-in-charge should use an assessment such as the equation below to estimate the heat release rate required to flashover the ignition room.

Where:

\[ Q = \frac{H \times O}{A} \]

(1) Example of formula to determine achieving flashover for small room - 1- Exterior door that is 80" (2.03 m) high and 36" (0.91 m) and 1- window 30" x 40" (Based on the size of the door flashover will occur at approximately 2 MW. Window 40" (1.02 m) high and 30" (0.76 m) wide will support 0.6 MW. The minimum energy required to flashover over the room would be approximately 2.6 MW.)

(2) Fuel Load: Calculated to have enough fuel load to achieve a sustained flashover in a ventilated space.

Additional Proposed Changes
Statement of Problem and Substantiation for Public Comment

This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.

Related Item
Public Input No. 23-NFPA 1403-2014 [New Section after 4.4.4]

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
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Submittal Date: Mon Nov 16 11:53:32 EST 2015

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-19-NFPA 1403-2016
Statement: This comment is an output of the Ch 4 Task Group to address the need to improve the fire dynamics knowledge of the students while providing a controlled training environment.
\[ \dot{Q} = 750 A_o \sqrt{H_o} \]

Where:

- \( \dot{Q} \) = Minimum Heat Release Rate (kW) required for flashover
- \( A_o \) = Area of opening (m²)
- \( H_o \) = Height of opening (m)