Technical Committee on Fixed Guideway Transit and Passenger Rail Systems (FKT-AAA)

MEMORANDUM

DATE: October 2, 2014

TO: Principal and Alternate Members of the Technical Committee on Fixed Guideway Transit and Passenger Rail Systems (FKT-AAA)

FROM: Chad Duffy, NFPA Staff Liaison
Office: (617) 984-7562 Email: cduffy@nfpa.org

SUBJECT: AGENDA – NFPA 130 First Draft Meeting (Annual 2016)

Enclosed is the agenda for the First Draft meeting for NFPA 130, Standard for Fixed Guideway Transit and Passenger Rail Systems, which will be held at the Holiday Inn – Inner Harbor, Baltimore, MD 8:00am to 6:00pm EDT on Monday November 17, 2014, Tuesday, November 18, 2014 and November 19, 2014 from 8:00am to 3:00pm.

Please submit requests for additional agenda items to the chair at least seven days prior to the meeting, and notify the chair and staff liaison as soon as possible if you plan to introduce any first revisions at the meeting.

All NFPA Technical Committee meetings are open to the public. Please contact me for information on attending a meeting as a guest. Read NFPA's Regulations Governing the Development of NFPA Standards (Section 3.3.3.3) for further information.

Additional Meeting Information:
See the Meeting Notice on the Document Information Page (www.nfpa.org/130next) for meeting location details. If you have any questions, please feel free to contact Elena Carroll, Project Administrator at 617-984-7952 or by email ecarroll@nfpa.org.

C. Standards Administration
AGENDA

Monday, November 17, 2014

1. Call to Order – 8:00 AM
2. Introductions and Attendance
3. Review Agenda/Discussion of Next Meeting Location
4. NFPA Staff Liaison Presentation and Review of Key Dates in Current Cycle
5. Chairman Comments
6. Approval of Previous Meeting Minutes
7. Act on Public Input for NFPA 130
8. Adjourn – 6:00 PM

Tuesday, November 18, 2014

1. Call to Order – 8:00 AM
2. 2-Hour break-out session for task groups - 8:30 - 10:30 am
3. Act on Public Input for NFPA 130
4. Adjourn – 6:00 PM

Wednesday, November 19, 2014

1. Call to Order – 8:00 AM
2. Complete Action on Public Input for NFPA 130
3. New business – Finalize next meeting location – NFPA will send out proposed dates and location alternates
4. Adjourn Meeting – 3:00 PM

Please submit requests for additional agenda items to the chair at least seven days prior to the meeting.

Please notify the chair and staff liaison as soon as possible if you plan to introduce any first revisions or committee input at the meeting.
Key Dates for the Annual 2016 Revision Cycle

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposal Closing Date</td>
<td>July 8, 2014</td>
</tr>
<tr>
<td><strong>Final Date for First Draft Meeting</strong></td>
<td><strong>December 12, 2014</strong></td>
</tr>
<tr>
<td>Posting of First Draft and TC Ballot</td>
<td>January 30, 2015</td>
</tr>
<tr>
<td><strong>Ballots Returned By</strong></td>
<td><strong>February 20, 2015</strong></td>
</tr>
<tr>
<td>Post Final First Draft</td>
<td>March 6, 2015</td>
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<tr>
<td>Comment Closing Date</td>
<td>May 15, 2015</td>
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<tr>
<td><strong>Final Date for Second Draft Meeting</strong></td>
<td><strong>October 30, 2015</strong></td>
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<tr>
<td>Posting of Second Draft and TC Ballot</td>
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<tr>
<td><strong>Ballots Returned By</strong></td>
<td><strong>January 4, 2016</strong></td>
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<tr>
<td>Posting Final Second Draft</td>
<td>January 18, 2016</td>
</tr>
<tr>
<td>Closing Date for Notice of Intent to Make a Motion (NITMAM)</td>
<td>February 19, 2016</td>
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<tr>
<td><strong>Issuance of Consent Document (No NITMAMs)</strong></td>
<td><strong>May 13, 2016</strong></td>
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<tr>
<td>NFPA Annual Meeting</td>
<td>June 13-16, 2016</td>
</tr>
<tr>
<td><strong>Issuance of Document with NITMAM</strong></td>
<td><strong>August 4, 2016</strong></td>
</tr>
</tbody>
</table>

Technical Committee deadlines are in **bold**.
Meeting Preparation
Committee members are strongly encouraged to review the published input prior to the meeting and to be prepared to act on each item.

Handout materials should be submitted to the chair at least seven days prior to the meeting.

Only one posting of the input will be made; it will be arranged in section/order and will be pre-numbered. This will be posted to the NFPA Document information pages located at www.nfpa.org/130. If you have trouble accessing the website please contact Elena Carroll at ecarroll@nfpa.org.

Mandatory Materials:
- Last edition of the standard
- Meeting agenda
- Public input/comments
- Committee Officers’ Guide (Chairs)
- Roberts’ Rules of Order (Chairs; An abbreviated version may be found in the Committee Officer’s Guide)

Optional Materials:
- NFPA Annual Directory
- NFPA Manual of Style
- Prepared committee input/comments (If applicable)

Regulations and Guiding Documents
All committee members are expected to behave in accordance with the Guide for the Conduct of Participants in the NFPA Codes and Standards Development Process.

All actions during and following the committee meetings will be governed in accordance with the Regulations Governing the Development of NFPA Standards. Failure to comply with these regulations could result in challenges to the standards-making process. A successful challenge on procedural grounds could prevent or delay publication of the document.

The style of the document must comply with the Manual of Style for NFPA Technical Committee Documents.
General Procedures for Meetings

- Use of tape recorders or other means capable of producing verbatim transcriptions of any NFPA Committee Meeting is not permitted.

- Attendance at all NFPA Committee Meetings is open. All guests must sign in and identify their affiliation.

- Participation in NFPA Committee Meetings is generally limited to committee members and NFPA staff. Participation by guests is limited to individuals, who have received prior approval from the chair to address the committee on a particular item, or who wish to speak regarding public input or comments that they submitted.

- The chairman reserves the right to limit the amount of time available for any presentation.

- No interviews will be allowed in the meeting room at any time, including breaks.

- All attendees are reminded that formal votes of committee members will be secured by letter ballot. Voting at this meeting is used to establish a sense of agreement, but only the results of the formal letter ballot will determine the official action of the committee.

- Note to Special Experts: Particular attention is called to Section 3.3(e) of the NFPA Guide for the Conduct of Participants in the NFPA Codes and Standards Development Process in the NFPA Directory. This section requires committee members to declare any interest they may represent, other than their official designation as shown on the committee roster. This typically occurs when a special expert is retained by and represents another interest category on a particular subject. If such a situation exists on a specific issue or issues, the committee member shall declare those interests to the committee and refrain from voting on any action relating to those issues.

- Smoking is not permitted at NFPA Committee Meetings.
<table>
<thead>
<tr>
<th>Possible Action #1: Resolve PI (no change to section)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action Required</strong></td>
<td><strong>Sample motion</strong></td>
</tr>
<tr>
<td>Make a statement to resolve a PI</td>
<td>I move to resolve PI # with the following statement . . .</td>
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</table>

<table>
<thead>
<tr>
<th>Possible action #2: Create First Revision (make a change to a section)</th>
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<tbody>
<tr>
<td><strong>Action Required</strong></td>
<td><strong>Sample motion</strong></td>
</tr>
<tr>
<td>Step 1 Create a First revision based one or more PIs</td>
<td>I move to create a First Revision based on PI #</td>
</tr>
<tr>
<td>Step 2 If the revision is related to multiple PIs, generate a statement to respond to all of them together</td>
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<thead>
<tr>
<th>Possible Action 3: Create Committee input</th>
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</thead>
<tbody>
<tr>
<td><strong>Action Required</strong></td>
<td><strong>Sample motion</strong></td>
</tr>
<tr>
<td>Step 1 Create proposed revision for solicitation of public comments</td>
<td>I move to create CI with a proposed revision to X as follows . . .</td>
</tr>
<tr>
<td>Step 2 Generate a statement to explain the intent and why the Committee is seeking public comment</td>
<td></td>
</tr>
</tbody>
</table>
Attachment #1:
Previous Meeting Minutes
MINUTES OF ROC MEETING

Day 1 – October 14, 2012

Meeting Called To Order:
Chairperson Harold Levitt called the meeting to order on October 14, 2012. Mr. Levitt outlined the main objective of the meeting and reviewed the agenda for the next few days; the Committee will initially review all public comments, and if time permits we will entertain Committee Comments. There should be no reason why we would not have enough time to develop Committee Comments.

Approval of ROP meeting minutes on January 22-25, 2012
The first order of business was to approve the January 22-25, 2012 ROP meeting minutes, a motion to approve was so moved by the committee.

NFPA Staff Liaison Report
The committee’s staff liaison, Sandra Stanek reviewed the rules of order for the ROC session by means of a PowerPoint Presentation. She stated that Robert’s Rules of Order would be followed and that any deviation from this method would be under the auspices of the Committee Chair. During this presentation, critical timelines for this 2014 edition were presented (refer to Table 2 below); the fact that all Public Comments must be acted upon at this session or a follow-up session must be held prior to November 2, 2012, should the task of this committee not be completed by the time of adjournment Wednesday, October 17, 2012 at 5:00 PM. Sandra explained the balloting process and that; ballots for formal voting would be sent to all committee members soon after the meeting. All Voting members and their alternates should vote. She then went into the ROC component of the process and stated that no new material could be introduced at this time. Any new material would have to be held for the next edition.

Table 2

<table>
<thead>
<tr>
<th>PROCESS STEPS – A2013 CYCLE</th>
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<td>Proposal Closing Date</td>
<td>11/24/2011</td>
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<tr>
<td>ROP Meeting Held</td>
<td>01/22 to 01/25/2012</td>
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<tr>
<td>Final date for mailing TC Ballots</td>
<td>3/16/2012</td>
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<tr>
<td>Receipt of Committee ballots</td>
<td>5/4/2012</td>
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<td>ROP Printed and Published</td>
<td>06/22/2012</td>
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<td>Comment Closing</td>
<td>08/31/2012</td>
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<tr>
<td>ROC Meeting</td>
<td>10/14 to 10/17/2012</td>
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<tr>
<td>Final Date for ROC meeting</td>
<td>11/02/2012</td>
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<tr>
<td>ROC Published and Posted</td>
<td>02/22/2013</td>
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<td>NITMAN Closing Date</td>
<td>04/15/2013</td>
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<tr>
<td>NFPA Association Meeting for Document</td>
<td>06/10 to 06/13/2013</td>
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<tr>
<td>Issue Document</td>
<td>08/01/2013</td>
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</table>
Introductions and Attendance:

The meeting attendance sheets are attached.

Day 1 – Sunday, October 14, 2012

- Call to Order – 1:00 PM PST
- Introductions & Attendance
- Review Agenda
- NFPA Staff Liaison presentation & review of key dates within current cycle
- Chairman Comments
- Approval of last meeting minutes (Harold Levitt)
- Act on Public Comments for NFPA 130
- Adjourn by 5:00 PM PST

Day 2 – Monday, October 15, 2012

- Call to Order – 8:00 AM MST
- Act on Public Comments for NFPA 130
- Task Group assignment for UL 2196 issue for Committee Comment & TIA development for current edition (Chairman Marcelo Hirschler, James Conrad, Arnold Dix & David Plotkin)
- Adjourn by 5:00 PM PST

Day 3 – Tuesday, October 16, 2012

- Call to Order – 8:00 AM MST
- Act on Public Comments for NFPA 130

Presentation by UL Laboratories - Al Ramairez – UL 2196

- **On Sept.12, 2012 UL announced it will not offer certification to the previous program (UL2196) for circuit integrity cable testing in accordance with 2196 tests for Fire resistive Cables. UL has offered an interim testing program for subscribers who wish to have fire resistive cables for use in electrical circuit protective systems tested by UL 2196.**
- Adjourned at 5:00 PM
Day 4 - Wednesday October 17, 2012

- Call to Order – 8:00 AM PST
- Completed review and action on Public Comments for NFPA 130

Task Group concerning UL 2196 issue - Presented by Marcelo Hirschler:
Marcelo Hirschler presented the wording for Committee Comment #15 and TIA development for the existing edition. The Committee Comment #15 would be “HELD” until after a conference call (Adobe Connect meeting) takes place by the NFPA 502 Technical Committee on Oct. 31st. UL is holding a meeting in Ottawa on Oct. 24th to discuss the UL2196 issue. Hopefully more information would come out of this meeting. The Committee Comment will require “finetuning” after we know more information. We will schedule a web conference to discuss this at a later date.

- Generated remaining Committee Comments for NFPA 130
- Adjourn by 12:30 PM PST
- Staff Liaison Sandra Stanek showed all of us the “new process” software. The next revision cycle will use the new process. She stated anyone with questions concerning the “new process” can go to the following website for questions: www.nfpa.org/newregstraining/Publicinput

Respectfully submitted,
Sandra Stanek
NFPA Staff Liaison

Committee Members and Guests Attendees

<table>
<thead>
<tr>
<th>PRINCIPAL</th>
<th>REPRESENTING</th>
<th>PRESENT</th>
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<tbody>
<tr>
<td>Harold Levitt</td>
<td>Port Authority of New York &amp; New Jersey</td>
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<tr>
<td>David Casselman</td>
<td>Lea &amp; Elliott, Inc.</td>
<td></td>
</tr>
<tr>
<td>Mark Chan</td>
<td>Bay Area Rapid Transit District (BART)</td>
<td></td>
</tr>
<tr>
<td>John Devlin</td>
<td>Aon Fire Protection Engineering</td>
<td></td>
</tr>
<tr>
<td>Charles Giblin III</td>
<td>International Fire Marshals Association</td>
<td></td>
</tr>
<tr>
<td>Kevin Harrison</td>
<td>Fire Department City of New York</td>
<td></td>
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<tr>
<td>Harold Locke</td>
<td>Locke &amp; Locke Inc.</td>
<td></td>
</tr>
<tr>
<td>Luc Martineau</td>
<td>Societe de Transport de Montreal (STM)</td>
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<tr>
<td>Daniel McKinney</td>
<td>AECOM Transportation</td>
<td></td>
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<tr>
<td>Thomas Middlebrook</td>
<td>MRC/MMM Group Limited</td>
<td></td>
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<tr>
<td>Robert Montfort</td>
<td>Metropolitan Transportation Authority</td>
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<tr>
<td>James Quiter</td>
<td>Arup</td>
<td></td>
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<tr>
<td>Susan Reed Tanaka</td>
<td>Toronto Transit Commission</td>
<td></td>
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<tr>
<td>Steven Roman</td>
<td>LTK Engineering Services</td>
<td></td>
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<tr>
<td>Julian Sandu</td>
<td>Chicago Transit Authority</td>
<td></td>
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<tr>
<td>Robert Till</td>
<td>John Jay College of Criminal Justice</td>
<td></td>
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<tr>
<td>Stephen Wilcheck</td>
<td>National Railroad Passenger Corporation</td>
<td></td>
</tr>
<tr>
<td>Silas Li</td>
<td>Parsons Brinkerhoff, Inc.</td>
<td></td>
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ALTERNATE
<table>
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<tr>
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<tbody>
<tr>
<td>Ervin Cui</td>
<td>Aon Corporation</td>
</tr>
<tr>
<td>Katherine Fagerlund</td>
<td>Sereca Fire Consulting Ltd.</td>
</tr>
<tr>
<td>Ritch Hollingsworth</td>
<td>LTK Engineering Services</td>
</tr>
<tr>
<td>Donald Iannuzzi</td>
<td>Metropolitan transportation Authority</td>
</tr>
<tr>
<td>Vincent Kwong</td>
<td>Bay Area Rapid Transit District (BART)</td>
</tr>
<tr>
<td>Pierre Laurin</td>
<td>Toronto Transit Commission</td>
</tr>
<tr>
<td>William Segar</td>
<td>Bombardier Transportation</td>
</tr>
<tr>
<td>Arnold Dix</td>
<td>Lawyer/Scientist/Adj. Prof. Engineering</td>
</tr>
<tr>
<td></td>
<td><strong>GUESTS</strong></td>
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<tr>
<td>James Conrad</td>
<td>RSCC</td>
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<td>Peter Senez</td>
<td>Sereca Fire Consulting Ltd.</td>
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<td>Thomas Eng</td>
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<td>Marcelo Hirschler</td>
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<td>David Plotkin</td>
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<tr>
<td>Fred Dawson</td>
<td>Dupont Canada</td>
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<tr>
<td>Ana Ruiz, PhD</td>
<td>TD&amp;T LLC</td>
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<tr>
<td>Ed Walton</td>
<td>DRAKA</td>
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<tr>
<td>Ian Ong</td>
<td>Hatch Mott MacDonald</td>
</tr>
<tr>
<td>Steven White</td>
<td>Long Island Railroad</td>
</tr>
<tr>
<td></td>
<td><strong>NFPA STAFF</strong></td>
</tr>
<tr>
<td>Sandra Stanek</td>
<td>NFPA Staff Liaison</td>
</tr>
<tr>
<td>Rich Bielen</td>
<td>NFPA</td>
</tr>
</tbody>
</table>
NFPA 130

Conference Call concerning CC#15 from ROC Meeting

Nov. 15, 2012

10:30-11:30 AM


1. Harold Leavitt (Chairman) began the meeting with a roll call.

2. Harold stated we were on the line to simply review the Committee Comment #15 concerning the UL2196 issue that we “tabled” at the ROC meeting in San Diego. We were waiting until the NFPA 502 conference call took place, as all of the stakeholders concerning UL 2196 issues were on that call. This revised Committee Comment simply “mirrors” the same information gleaned from the NFPA 502 conference call.

3. There was some Manual of Style and formatting issues with the comment.

4. The TC members voted affirmative on the revised wording to CC#15. It was noted that the CC#15 revision would be added the ROC file for balloting.

5. The revised Committee Comment will be sent to the entire committee.

6. The next step is to develop a TIA to reflect the change in the current edition.

7. The meeting adjourned at 11:30 AM.

Respectfully submitted by,

Sandra Stanek

Staff Liaison
Attachment #2: Public Input/130
NOTE: The following Public Input appeared as Rejected but held (Hold) in Public Comment No. 130-18 of the A2013 Second Draft Report (ROC) for NFPA 130 and per the Regs. at 4.4.8.3.1.

Additional Proposed Changes

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description Approved</th>
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</thead>
<tbody>
<tr>
<td>130-18.pdf</td>
<td>130-18</td>
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</tbody>
</table>

Statement of Problem and Substantiation for Public Input

See the Uploaded File.

Submitter Information Verification

Submitter Full Name: TC on FKT-AAA
Organization: TC on Fixed Guideway Transit and Passenger Rail Systems
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Feb 20 13:08:17 EST 2014
7.2.3 The design shall encompass the following:

(1) The fire heat release rate and fire smoke release rate produced by the combustible load of a vehicle and any combustible materials that could contribute to the fire load at the incident site.

(2) The fire growth rate.

7.2.3.1* One or more design fire scenarios plus gas inflows where geological conditions deem it appropriate. Fires caused by including arson, vandalism, spontaneous combustion and equipment failures shall be considered. The following design fire scenarios shall be considered. Each design fire scenario shall have a fire profile.

7.2.3.1.1 A vehicle fire originating outside the vehicle interior such as below the floor or rooftop.

7.2.3.1.2 A vehicle fire originating in the vehicle interior. If the vehicle has an onboard fire suppression system meeting the requirements of NFPA 750, the design FCORR, EHRR, FSORR and FSMRR for this design fire scenario shall be considered zero. This shall not negate the need to have a minimum tunnel air velocity for the removal of cold smoke.

7.2.3.1.3 For dual-powered vehicles (diesel and electric traction), a fire resulting from the puncture of a fuel tank or battery.

7.2.3.1.4 A station or tunnel fire consuming trash, luggage, wayside electrical equipment, etc.

7.2.3.1.5 A fire in a non-transit occupancy such as a kiosk or small shop that is unsprinklered.

7.2.3.1.6 A maintenance vehicle or work-train fire. If maintenance vehicles are never in the stations or tunnels during periods of revenue operations, then maintenance vehicle or work train fire scenarios do not have to be considered as design fire scenarios.

7.2.3.2 Station and trainway geometries

7.2.3.3 The effects of elevation, elevation differences, ambient temperature differences, and ambient wind.

7.2.3.4 A system of fans, shafts, and devices for directing airflow in stations and trainways.

7.2.3.5 A program of predetermined emergency response procedures capable of initiating prompt response from the operations control center in the event of a fire emergency.

7.2.3.6 A ventilation system reliability analysis that, as a minimum, considers the following subsystems:
 Annex H. Fire Profile Methodologies

This annex is not part of the requirements of this NFPA document but is included for informational purposes only.

H.1 Introduction. This annex presents information on methodologies used for predicting fire profiles. This is a rapidly changing field and designer should assure himself/herself of the appropriateness of the methodology selected.

H.2 General.

H.2.1 Use of Fire Profile. As per Section 7.2.1(2), critical velocity is the criteria for determining the required tunnel airflow and hence the ventilation system fan capacities required for tunnel fire incidents. The most commonly used software is the Subway Environment Simulation (SES) computer program. Reference [1]. The steady FHRR is the primary “fire” input.

Tenability in stations is usually predicted by computational fluid dynamics (CFD) programs such as the Fire Dynamics Simulator [2], FLUENT [3], CFX [4], Star-CD [5] and Flow 3D [6]. The predicted fire profile is an input to these programs which predict temperatures, visibilities, and carbon monoxide concentrations as a function of the three-dimensional location in the station and time since the initiation of the fire.

H.2.3 Fire Causes. Fire causes selected are not the same for all fixed guideway and passenger rail systems. For example, some systems design for arson and others do not. This decision may be based on cost, the inferred risk or a formal threat and vulnerability assessment. Arson may be defined as using man-portable quantity of a flammable fluid, etc. with the intent of causing a large fire with causalities and significant damage. Vandalism may be defined as setting fire to newspapers, trash, etc. with the intent of causing a nuisance.

H.2.4 Soot and Carbon Monoxide Yield Rates. Soot and CO yield rates are published in a number of sources such the Fire Protection Handbook [7]. This data is most often those for well-ventilated fires. As a result, soot and CO yield rates and therefore their concentrations may be higher in the early stages of a fire before the ventilating airflows reach design values. Data on this phenomena has been published for some liquid fires but NOT for all materials.

H.2.5 Impacts of Ventilation System Design. FHRR is the governing criteria for the design of tunnel ventilation. Experience to date has shown that visibility is most often the governing criteria for the design of stations and their ventilation. Temperature has been on rare occasions to be the governing criteria. Carbon monoxide has not been found to be the governing criteria. Since FCORR and FSORR are scalers, it is possible to relate visibility and CO criteria via their yield rates and not have to present CO concentrations.

H.3 Vehicle Fires.

H.3.1 History. Two approaches were used prior to the late 1990s. The first consisted of spread sheet calculations based on the train total fire load and an assumed time to combust were used to estimate the train FHRR. Fire carbon monoxide, fire smoke and fire soil release rates were not estimated. The emphasis was on the determining the steady-state fire heat release rates which were used to determine the capacities and operating modes of the tunnel ventilation system. A paper published in the 1998 ASHRAE Proceedings [8] presents the details of this approach. The second approach was comparing the properties of the design vehicle to a similar one and using a similar FHRR. Another manual approach was developed in the year 2005. This assumes a well-ventilated flashed-over interior car fire. The FHRRs for each interior material are summed to the total FHRR. The methodology can be used to estimate the maximum FCORRs, FHRRs and FSORRs but NOT the FGR. As a result, the volume and geometry of the station smoke reservoir needed prior to the ventilation airflows reach steady-state can be significantly under-estimated.

Beginning about 2005, at least two computer programs came into use for predicting fire profiles. In the USA, they have been applied to two commuter rail projects, one heavy rail transit project and one light rail project. These applications are described in References [9] through [15]. In 2007, the fire profile for fuel tank spill caused by a puncture was predicted. This application is described in Reference [15].

H.3.2 Computer Programs for Predicting Fire Profile. The most widely used are HAIFIRE [16] and the Fire Dynamics Simulator(FDS) [2]. They predict pre- and post-flashover fire profiles. They are very well validated. Their documentation explains their validation. Their input includes the following car data:

(1) Interior geometry including seating layouts, orientations and dimensions
(2) Overall thermal transmission value for vehicle body
(3) Openings including windows and doors, whether they are composed of plastic or glass and at what temperatures they become open. The latter may occur because of melting or failure of retaining seals.

(4) Mechanical ventilation – quantity and location

(5) Characteristics of car interior materials measured according to ASTM E1354

(6) Ignition temperatures of car interior materials

(7) Initial conditions including doors and windows open or closed

(8) Quantity of accelerant or characteristic of initiator

When selecting a computer program it is important to select the program that best fits the need of the problem rather than to select the program on availability.

H.3.3 Car-to-Car Fire Spread. The fire may spread from car to car. Parameters that affect this are the fire resistances of the car ends, whether the interior car doors are left open or closed, whether the cars have “bellows” connecting them or not, the tunnel ventilation moving the heat from the fire site downstream to the next car, whether the car exterior windows are glass or polycarbonate, whether the station has sprinklers or not. A typical assumption is the “next” car will ignite 15 minutes after the first car reaches steady FHRR.

H.3.4 Fizzle or Flashover. Some of the references below conclude that an NFPA 130 2007 compliant car will not flashover unless an arson event with two liters (one-half gallon) or more of flammable liquid occurs. The designer should seek to verify this possibility. It could reduce the ventilation required significantly.

H.4 Trash, Luggage and Wayside Electrical Fires.

Tests on luggage have been formed [17]. They indicate FHRRs on the order of 300 kW (1.02 MBtu/hr) to 1000 kW (3.41 MBtu/hr). It has become common to use a FHRR of 1 MW (3.41 MBtu/hr); however, one transit system has designed for 2 MW (6.82 MBtu/hr). Because of its soot yield, polystyrene has often been used to estimate the accompanying FCORR and FSORRs.

H.5 Fires in non-transit public area occupancies such as a kiosk or small shop that are unsprinklered. NFPA 92 [18] and “Handbook of Smoke Control Engineering” [19] provide guidance on the estimation of FHRRs and ventilation for these occupancies. Assumptions concerning materials being consumed may have to be made to properly estimate FCORRs and FSORRs.

H.6 Maintenance Vehicle and Work Train Fires.

Little work has been done in predicting fire profiles for maintenance vehicles and work trains. The primary risk appears to be a fuel spill fire resulting from the puncture of a fuel tank or the rupture of a fuel lines. See Reference [15].

H.7 References. The following references are cited in this annex.


(2) National Institute of Standards and Technology, “Fire Dynamics Simulator”

(3) FLUENT CFD Package by ANSYS

(4) CFX CFD package by ANSYS

(5) Star-CD by CD Adapco

(6) Flow 3D by Flow Science


Note: It must be noted that in the following 7 reports the fire profiles predicted are NOT in the public domain but the methodologies are.


(16) HAFIRE by Hughes Associates, Inc.

(17) E-mail from Richard Custer of Arup to WD Kennedy of Parsons Brinckerhoff, 19 October 2007.


Substantiation: The Committee has for sometime recognized the need for the Standard to provide minimum requirements concerning the selection of design fires. This proposal does that. All numerical data presented is provided in the references listed in the new Annex H.

This is not original material; its reference/source is as follows: 
William D. Kennedy’s ROP #233.

Committee Meeting Action: Hold

Committee Statement: The comment introduces material that is too extensive to address during this cycle but warrants future committee action in the next cycle.

Number Eligible to Vote: 32

Ballot Results: Affirmative: 28

Ballot Not Returned: Grizard, W., Middlebrook, T., Thomas, M., Weng, L.
Public Input No. 11-NFPA 130-2014 [ Global Input ]

NOTE: The following Public Input appeared as Rejected but held (Hold) in Public Comment No. 130-62 of the A2013 Second Draft Report (ROC) for NFPA 130 and per the Regs. at 4.4.8.3.1.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

See the Uploaded File.

Submitter Information Verification

Submitter Full Name: TC on FKT-AAA
Organization: TC on Fixed Guideway Transit and Passenger Rail Systems
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Feb 20 13:09:57 EST 2014
Submitter: John Nelsen, Seattle Fire Department
Comment on Proposal No: 130-17
Recommendation: Add new text to read as follows:

5.4.8.1 Pathway survivability for emergency communication system circuits shall conform to NFPA 72.

Substantiation: I support the rejection of this proposal on the basis that it is incomplete and as such potentially creates some serious conflicts I would support the creation of a new task group to identify the extent to which elements of NFPA 72, National Fire Alarm and Signaling Code are applicable to the types of facilities covered by NFPA 130. There are long standing requirements for one-way and two-way emergency communication systems in NFPA 130 that have been there since well before any prescriptive design and/or installation requirements where covered by NFPA 72. The detailed treatment of these types of systems now included in the 2010 edition of NFPA 72 would seem to dictate a comprehensive review to ensure consistency of terminology and application. The following proposed changes are offered in an attempt to address some of the gaps which resulted in the rejection of the original proposal.

This is not original material; its reference/source is as follows:

Committee Meeting Action: Hold
Committee Statement: The comment introduces material that is too extensive to address during this cycle but warrants future committee action in the next cycle.
Number Eligible to Vote: 32
Ballot Results: Affirmative: 28
Ballot Not Returned: 4 Grizard, W., Middlebrook, T., Thomas, M., Weng, L.
NOTE: The following Public Input appeared as Rejected but held (Hold) in Public Comment No. 130-71 of the A2013 Second Draft Report (ROC) for NFPA 130 and per the Regs. at 4.4.8.3.1.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

Recommendation:
Add new text:
5.5.5 (6) Bikes must not allow on escalators.
Substantiation: Patron carrying bike on escalator has been a safety issue for a long time. Due to the business nature, escalator is an required means of exit. In order to ensure the state of condition of escalators at all times, I believe this new text is necessary.

Submitter Information Verification

Submitter Full Name: TC on FKT-AAA
Organization: TC on Fixed Guideway Transit and Passenger Rail Systems
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Feb 20 13:15:02 EST 2014
Submitter: Mark Chan, Bay Area Rapid Transit District (BART)
Comment on Proposal No: N/A
Recommendation: Add new text:
  5.5.5 (6) Bikes must not allow on escalators.
Substantiation: Patron carrying bike on escalator has been a safety issue for a long time. Due to the business nature, escalator is an required means of exit. In order to ensure the state of condition of escalators at all times, I believe this new text is necessary.
Committee Meeting Action: Hold
Committee Statement: The comment introduces material that is too extensive to address during this cycle but warrants future committee action in the next cycle.
Number Eligible to Vote: 32
Ballot Results: Affirmative: 27 Negative: 1
Ballot Not Returned: Grizard, W., Middlebrook, T., Thomas, M., Weng, L.
Explanation of Negative:
  NELSEN, J.: This is an operational issue that is outside the scope of this standard in my opinion.
Public Input No. 13-NFPA 130-2014 [ Global Input ]

NOTE: The following Public Input appeared as Rejected but held (Hold) in Public Comment No. 130-148 of the A2013 Second Draft Report (ROC) for NFPA 130 and per the Regs. at 4.4.8.3.1.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

See the Uploaded File.

Submitter Information Verification

Submitter Full Name: TC on FKT-AAA
Organization: TC on Fixed Guideway Transit and Passenger Rail Systems
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Feb 20 13:17:16 EST 2014
Submitter: John Nelsen, Seattle Fire Department
Comment on Proposal No: 130-17
Recommendation: Revise text to read as follows:

10.6 Public Address (PA) One-Way Emergency Communication System.

10.6.1 All stations, as determined by the authority having jurisdiction, shall have a PA be provided with a one-way emergency communication system conforming to NFPA 72. for communicating with passengers and employees. (For one-way communication requirements for vehicles, see Section 8.9.2.)

10.6.2 The OCC shall have the capability of using the PA system to make announcements throughout stations.

10.6.3 Authority supervisory employees and emergency response personnel at stations shall have the capability of making announcements throughout public areas on the PA system:

10.6.4 During interruptions of train service or delays for any reason associated with an emergency, fire, or smoke, the passengers and employees shall be kept informed by means of the PA system:

10.6.5 At times of emergency, the PA system shall be used to communicate with passengers, employees, and participating agency personnel:

Substantiation: I support the rejection of this proposal on the basis that it is incomplete and as such potentially creates some serious conflicts I would support the creation of a new task group to identify the extent to which elements of NFPA 72, National Fire Alarm and Signaling Code are applicable to the types of facilities covered by NFPA 130. There are long standing requirements for one-way and two-way emergency communication systems in NFPA 130 that have been there since well before any prescriptive design and/or installation requirements where covered by NFPA 72. The detailed treatment of these types of systems now included in the 2010 edition of NFPA 72 would seem to dictate a comprehensive review to ensure consistency of terminology and application. The following proposed changes are offered in an attempt to address some of the gaps which resulted in the rejection of the original proposal.

Committee Meeting Action: Hold

Committee Statement: The comment introduces material which could have extensive implications that cannot be addressed during this cycle but warrants future committee action in the next cycle.

Number Eligible to Vote: 32
Ballot Results: Affirmative: 28
Ballot Not Returned: 4 Grizard, W., Middlebrook, T., Thomas, M., Weng, L.
Public Input No. 14-NFPA 130-2014 [ Global Input ]

NOTE: The following Public Input appeared as Rejected but held (Hold) in Public Comment No. 130-155 of the A2013 Second Draft Report (ROC) for NFPA 130 and per the Regs. at 4.4.8.3.1.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

See the Uploaded File.

Submitter Information Verification

Submitter Full Name: TC on FKT-AAA
Organization: TC on Fixed Guideway Transit and Passenger Rail Systems
Street Address:
City:
State:
Zip:
Submittal Date: Thu Feb 20 13:19:00 EST 2014
Submitter: James Conrad, RSCC

Comment on Proposal No: 130-209

Recommendation: Revise text to read as follows:

12.1.1* All wiring materials and installations other than for traction power shall conform to the requirements of NFPA 70 except as herein modified in this standard.

Substantiation: The additional requirements are not needed in open stations.

Committee Meeting Action: Hold

Committee Statement: The comment introduces material that is too extensive to address during this cycle but warrants future committee action in the next cycle.

Number Eligible to Vote: 32

Ballot Results: Affirmative: 26 Negative: 2

Ballot Not Returned: 4 Grizard, W., Middlebrook, T., Thomas, M., Weng, L.

Explanation of Negative:

LOCKE, H.: This Comment should have been rejected based on action in Comment 130-151 (Log #CC13). Neither the Substantiation nor the Committee Statement appear to match the Comment.

MARKOS, S.: Agree with Mr. Locke's vote comment.
Public Input No. 9-NFPA 130-2014 [ Global Input ]

NOTE: The following Public Input appeared as Rejected but held (Hold) in Public Comment No. 130-14 of the A2013 Second Draft Report (ROC) for NFPA 130 and per the Regs. at 4.4.8.3.1.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

See the Uploaded File.

Submitter Information Verification

Submitter Full Name: TC on FKT-AAA
Organization: TC on Fixed Guideway Transit and Passenger Rail Systems
Street Address: 
City: 
State: 
Zip: 

Submittal Date: Thu Feb 20 13:06:04 EST 2014
Submitter: John Nelsen, Seattle Fire Department
Comment on Proposal No: 130-17
Recommendation: Revise text to read as follows:

3.3.8 Communications. Radio, telephone, and messenger services throughout the system and particularly at the operations control center and command post.

3.3.X Emergency Communications System. A system for the protection of life by indicating the existence of an emergency situation and communicating information necessary to facilitate an appropriate response and action.

3.3.X.1 One-Way Emergency Communications System. One-way emergency communications systems are intended to broadcast information, in an emergency, to people in one or more specified indoor or outdoor areas. It is intended that emergency messages be conveyed either by audible, visible, or textual means, or any combination thereof.

3.3.X.1.1 In-Building Fire Emergency Voice/Alarm Communications System. Dedicated manual or automatic equipment for originating and distributing voice instructions, as well as alert and evacuation signals pertaining to a fire emergency, to the occupants of a building.

3.3.X.2 Two-Way Emergency Communications System. Two-way emergency communications systems are divided into two categories, those systems that are anticipated to be used by building occupants and those systems that are to be used by fire fighters, police, and other emergency services personnel. Two-way emergency communications systems are used to both exchange information and to communicate information such as, but not limited to, instructions, acknowledgement of receipt of messages, condition of local environment, and condition of persons, and to give assurance that help is on the way.

3.3.X Public Safety Radio Enhancement System. A system installed to assure the effective operation of radio communication systems used by fire, emergency medical services, or law enforcement agencies.

Substantiation: I support the rejection of this proposal on the basis that it is incomplete and as such potentially creates some serious conflicts I would support the creation of a new task group to identify the extent to which elements of NFPA 72, National Fire Alarm and Signaling Code are applicable to the types of facilities covered by NFPA 130. There are long standing requirements for one-way and two-way emergency communication systems in NFPA 130 that have been there since well before any prescriptive design and/or installation requirements where covered by NFPA 72. The detailed treatment of these types of systems now included in the 2010 edition of NFPA 72 would seem to dictate a comprehensive review to ensure consistency of terminology and application. The following proposed changes are offered in an attempt to address some of the gaps which resulted in the rejection of the original proposal.

This is not original material; its reference/source is as follows:

Committee Meeting Action: Hold
Committee Statement: The comment introduces material that is too extensive to address during this cycle but warrants future committee action in the next cycle.

Number Eligible to Vote: 32
Ballot Results: Affirmative: 28
Ballot Not Returned: 4 Grizard, W., Middlebrook, T., Thomas, M., Weng, L.
Statement of Problem and Substantiation for Public Input

If the user of NFPA 130 would like more information on the protection of these types of structures from lightning, NFPA 780 should be document they are referred to.

Submitter Information Verification

Submitter Full Name: Mark Morgan
Organization: East Coast Lightning Equipment
Affiliation: NFPA 780, References task group
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 15:08:49 EDT 2014
2.3.3 ASHRAE Publications.
ASHRAE, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

There are outdated references to various ASHRAE documents, this proposal seeks to update the reference to the most recent published version of those documents.

In addition, there’s a reference to the “ASHRAE Handbook Series”, but only three of the four handbooks are specifically listed (leaving out the Refrigeration handbook (2010 or 2014)). It would be more appropriate to reference the individual books, rather than a generic group of books. The current reference would be like referring to all volumes of the Encyclopedia. This makes the reference more precise.

Submitter Information Verification

Submitter Full Name: STEVEN FERGUSON
Organization: ASHRAE
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jan 31 08:51:48 EST 2014
2.3.4 ASTM Publications.
ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

Statement of Problem and Substantiation for Public Input

standard date updates

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jun 27 18:39:45 EDT 2014
2.3.4  ASTM Publications.
ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

Statement of Problem and Substantiation for Public Input

Update the year date for standard(s)

Submitter Information Verification

Submitter Full Name: Steve Mawn
Organization: ASTM International
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 10:07:06 EDT 2014
Public Input No. 60-NFPA 130-2014 [Sections 3.3, 3.3]

Sections 3.3, 3.3

3.3 General Definitions.
3.3. **Sound Pressure Level.** The logarithmic ratio of the root-mean squared sound pressure to the reference sound pressure (2.0×10^{-5} Pascals).

3.3.1 * Airflow Control Devices.
Nontraditional equipment used to minimize tunnel airflow, including air curtains, barriers, brattices, tunnel doors, downstands, enclosures, tunnel gates, and so forth.

3.3.2 Ancillary Area/Ancillary Space.
The nonpublic areas or spaces of the stations usually used to house or contain operating, maintenance, or support equipment and functions.

3.3.3 Authority.
The agency legally established and authorized to operate a fixed guideway transit and/or passenger rail system.

3.3.4 Backlayering.
The reversal of movement of smoke and hot gases counter to the direction of the ventilation airflow.

3.3.5 * Blue Light Station.
A location along the trainway, indicated by a blue light, where a person can communicate with the operations control center and disconnect traction power.

3.3.6 Building.
Any structure or group of structures in which fixed guideway transit and/or passenger rail vehicles are stored or maintained, including those in which inspection and service functions are performed, and other ancillary structures, such as substations and air-conditioning or ventilation facilities.

3.3.7 Combustible Load of a Vehicle.
The total value of heat energy that can be released through complete combustion of the components of a vehicle or fuel, expressed in joules [British thermal units (Btu)].

3.3.8 Command Post (CP).
The location at the scene of an emergency where the incident commander is located and where command, coordination, control, and communications are centralized. [402, 2013]

3.3. **Common Intelligibility Scale (CIS).** See NFPA 72-2013 Annex D.2.4.5.

3.3.9 Communications.
Radio, telephone, and messenger services throughout the system and particularly at the operations control center and command post.

3.3.10 Computational Fluid Dynamics.
A solution of fundamental equations of fluid flow using computer techniques allowing the engineer to identify velocities, pressures, temperatures, and so forth.

3.3.11 * Concourse.
Intermediate level(s) or area(s) connecting a station platform(s) to a public way via stairs, escalators, or corridors.

3.3.12 Critical Radiant Flux.
The level of incident radiant heat energy in units of W/cm^2 on a floor covering system at the most distant flameout point. [253, 2011]

3.3.13 Critical Velocity.
The minimum steady-state velocity of the ventilation airflow moving toward the fire within a tunnel or passageway that is required to prevent backlayering at the fire site.

3.3.14 Emergency Procedures Plan.
A plan that is developed by the authority with the cooperation of all participating agencies and that details specific actions required by all those who will respond during an emergency.

3.3.15 * Engineering Analysis.
A system analysis that evaluates all the various factors of relative to specific objectives for system performance.

3.3.15.1 * Fire Hazard Analysis.
A specific type of engineering analysis relative to the contribution of a material, component, or assembly to the overall fire hazard and the estimation of the potential severity of fires that can develop under defined fire scenarios.
3.3.16 Equivalency.
An alternative means of providing an equal or greater degree of safety than that afforded by strict
conformance to prescribed codes and standards.

3.3.17 Fire Command Center.
The principal attended or unattended room or area where the status of the detection, alarm
communications, control systems, and other emergency systems is displayed and from which the
system(s) can be manually controlled. [72, 2013]

3.3.18 Fire Emergency.
The existence of, or threat of, fire or the development of smoke or fumes, or any combination thereof, that
demands immediate action to correct or alleviate the condition or situation. [502, 2014]

3.3.19 Fire Growth Rate.
Rate of change of the heat release rate. Some factors that affect the fire growth rate are exposure,
geometry, flame spread, and fire barriers.

3.3.20 Effective Fire Load.
The portion of the total fire load (in joules or Btu) under a given, specific fire scenario of a certain fuel
package that would be expected to be released in a design fire incident.

3.3.21 Fire Smoke Release Rate.
Rate of smoke release for a given fire scenario expressed as a function of time [in m²/sec (ft²/sec)].

3.3.22 Flaming Dripping.
Periodic dripping of flaming material from the site of material burning or material installation.

3.3.23 Flaming Running.
Continuous flaming material leaving the site of material burning or material installation.

3.3.24 Guideway.
That portion of the fixed guideway transit or passenger rail system included within right-of-way fences,
outside lines of curbs or shoulders, underground tunnels and stations, cut or fill slopes, ditches, channels,
and waterways and including all appertaining structures.

3.3.25 Hazard.
Real or potential condition that can cause injury.

3.3.26 Headway.
The interval of time between the arrivals of consecutive trains at a platform in a station.

3.3.27 Heat Release Rate (HRR).
The rate at which heat energy is generated by burning. [921, 2011]

3.3.27.1 Average Heat Release Rate (HRR180).
The average heat release rate per unit area, over the time period starting at time to ignition and ending 180
seconds later, as measured in ASTM E 1354 (kW/m²).

3.3.27.2 Fire Heat Release Rate for Ventilation Calculations.
Rate of energy release for a given fire scenario expressed as a function of time [W (Btu/s)].

3.3.28 Incident Commander (IC).
The individual responsible for all incident activities, including the development of strategies and tactics and
the ordering and the release of resources. [472, 2013]

3.3.29 Level equivalent, the average sound level over time on an acoustical energy basis

3.3.30 Noncombustible (Material).
See Section 4.7.

3.3.31 Nonmechanical Emergency Ventilation System.
A system of smoke reservoirs, smoke vents, and/or dampers that are designed to support the tenability
criteria without the use of fans.

3.3.32 Occupancy.
3.3.31.1 Incidental Occupancies Within Stations.
The use of a portion of the station by others who are neither transit system employees nor passengers and where such space remains under the control of the system-operating authority.

3.3.31.2 Nonsystem Occupancy.
An occupancy not under the control of the system-operating authority.

3.3.32 Operations Control Center.
The operations center where the authority controls and coordinates the systemwide movement of passengers and trains from which communication is maintained with supervisory and operating personnel of the authority and with participating agencies when required.

3.3.33 Participating Agency.
A public, quasipublic, or private agency that has agreed to cooperate with and assist the authority during an emergency.

3.3.34 Passenger Load.

3.3.34.1 Detraining Load.
The number of passengers alighting from a train at a platform.

3.3.34.2 Entraining Load.
The number of passengers boarding a train at a platform.

3.3.34.3 Link Load.
The number of passengers traveling between two stations on board a train or trains.

3.3.35 Point of Safety.
A point of safety is one of the following: (1) an enclosed exit that leads to a public way or safe location outside the station, trainway, or vehicle; (2) an at-grade point beyond the vehicle, enclosing station, or trainway; (3) any other approved location.

3.3.36 Power Station.
An electric-generating plant for supplying electrical energy to the system.

3.3.37 Power Substation.
Location of electric equipment that does not generate electricity but receives and converts or transforms generated energy to usable electric energy.

3.3.38 Radiant Panel Index ($I_s$).
The product of the flame spread factor ($F_s$) and the heat evolution factor ($Q_s$), as determined in ASTM E 162.

3.3.39 Replace in Kind.
As applied to vehicles and facilities, to furnish with new parts or equipment of the same type but not necessarily of identical design.

3.3.40 Retrofit.
As applied to vehicles and facilities, to furnish with new parts or equipment to constitute a deliberate modification of the original design (as opposed to an overhaul or a replacement in kind).

3.3.41 Slow. The response time of a sound level meter’s RMS detector corresponding to a rise time constant of 1 second per ANSI S1.4 and IEC 61672.

3.3.42 Specific Extinction Area.
A measure of smoke obscuration potential per unit mass burnt, determined as the product of the specific extinction coefficient and the volumetric mass flow rate, divided by the mass loss rate [m/kg (ft/lb)].

3.3.43 Specific Optical Density ($D_s$).
The optical density, as measured in ASTM E 662, over unit path length within a chamber of unit volume, produced from a specimen of unit surface area, that is irradiated by a heat flux of 2.5 W/cm$^2$ for a specified period of time.
3.3.

**Speech Interference Level (SIL)**. A calculated quantity providing a guide to the interfering effect of noise on speech intelligibility. One-fourth of the sum of the band sound pressure levels for octave-bands with normal mid-band frequencies of 500, 1000, 2000, and 4000 Hz. Unit, decibel; abbreviation, SIL.

**Speech Transmission Index (STI)**. See NFPA 72-2013 Annex D.2.1.1.

3.44

Station. A place designated for the purpose of loading and unloading passengers, including patron service areas and ancillary spaces associated with the same structure.

3.44.1 Enclosed Station.
A station or portion thereof that does not meet the definition of an open station.

3.44.2 * Open Station.
A station that is constructed such that it is directly open to the atmosphere and smoke and heat are allowed to disperse directly into the atmosphere.

3.45 Station Platform.
The area of a station immediately adjacent to a guideway, used primarily for loading and unloading passengers.

3.46 Structure.

3.46.1 Elevated Structure.
Any structure not otherwise defined as a surface or underground structure.

3.46.2 Surface Structure.
Any at-grade or unroofed structure other than an elevated or underground structure.

3.47 System.

See 3.52.1, Fixed Guideway Transit System, or 3.52.2, Passenger Rail System.

3.48 Tenable Environment.
An environment that permits the self-rescue or survival of occupants.

3.49 Tourist, Scenic, Historic, or Excursion Operations.
Railroad operations, often using antiquated equipment, that are principally intended to carry passengers traveling for pleasure purposes.

3.50 Track.

3.50.1 Storage Track.
A portion of the trainway used for temporary storage or light cleaning of trains and not intended to be used for trains occupied by passengers.

3.50.2 Tail Track.
A portion of dead-end trainway used for temporary storage, turn-around, or light cleaning of trains and not intended to be used for trains occupied by passengers.

3.51 Trainway.
That portion of the system in which the vehicles operate.

3.52 Transportation Systems.

3.52.1 Fixed Guideway Transit System.
An electrified transportation system, utilizing a fixed guideway, operating on right-of-way for the mass movement of passengers within a metropolitan area, and consisting of its fixed guideways, transit vehicles, and other rolling stock; power systems; buildings; stations; and other stationary and movable apparatus, equipment, appurtenances, and structures.

3.52.1.1 Automated Fixed Guideway Transit System.
A fixed guideway transit system that operates fully automated, driverless vehicles along an exclusive right-of-way.

3.52.2 Passenger Rail System.
A transportation system, utilizing a rail guideway, operating on right-of-way for the movement of passengers within and between metropolitan areas, and consisting of its rail guideways, passenger rail vehicles, and other rolling stock; power systems; buildings; stations; and other stationary and movable apparatus, equipment, appurtenances, and structures.

3.53 Un-weighted Decibel (dBZ).
Decibel values without weighting applied.

3.53 Vehicle.
3.3.53.1 Fixed Guideway Transit Vehicle.
An electrically propelled passenger-carrying vehicle characterized by high acceleration and braking rates for frequent starts and stops and fast passenger loading and unloading.

3.3.53.2 Passenger Rail Vehicle.
A vehicle and/or power unit running on rails used to carry passengers and crew.

3.3.53 Voice Communication System. An amplified paging system for speech communication, including emergency notifications and announcements.

3.3 General Definitions.
3.3.1 Airflow Control Devices.
Nontraditional equipment used to minimize tunnel airflow, including air curtains, barriers, brattices, tunnel doors, downstands, enclosures, tunnel gates, and so forth.

3.3.2 Ancillary Area/Ancillary Space.
The nonpublic areas or spaces of the stations usually used to house or contain operating, maintenance, or support equipment and functions.

3.3.3 Authority.
The agency legally established and authorized to operate a fixed guideway transit and/or passenger rail system.

3.3.4 Backlayering.
The reversal of movement of smoke and hot gases counter to the direction of the ventilation airflow.

3.3.5 Blue Light Station.
A location along the trainway, indicated by a blue light, where a person can communicate with the operations control center and disconnect traction power.

3.3.6 Building.
Any structure or group of structures in which fixed guideway transit and/or passenger rail vehicles are stored or maintained, including those in which inspection and service functions are performed, and other ancillary structures, such as substations and air-conditioning or ventilation facilities.

3.3.7 Combustible Load of a Vehicle.
The total value of heat energy that can be released through complete combustion of the components of a vehicle or fuel, expressed in joules [British thermal units (Btu)].

3.3.8 Command Post (CP).
The location at the scene of an emergency where the incident commander is located and where command, coordination, control, and communications are centralized. [402, 2013]

3.3.9 Communications.
Radio, telephone, and messenger services throughout the system and particularly at the operations control center and command post.

3.3.10 Computational Fluid Dynamics.
A solution of fundamental equations of fluid flow using computer techniques allowing the engineer to identify velocities, pressures, temperatures, and so forth.

3.3.11 Concourse.
Intermediate level(s) or area(s) connecting a station platform(s) to a public way via stairs, escalators, or corridors.

3.3.12 Critical Radiant Flux.
The level of incident radiant heat energy in units of W/cm² on a floor covering system at the most distant flameout point. [253, 2011]

3.3.13 Critical Velocity.
The minimum steady-state velocity of the ventilation airflow moving toward the fire within a tunnel or passageway that is required to prevent backlayering at the fire site.

3.3.14 Emergency Procedures Plan.
A plan that is developed by the authority with the cooperation of all participating agencies and that details specific actions required by all those who will respond during an emergency.

3.3.15 Engineering Analysis.
A system analysis that evaluates all the various factors of relative to specific objectives for system performance.

3.3.15.1 Fire Hazard Analysis.
A specific type of engineering analysis relative to the contribution of a material, component, or assembly to the overall fire hazard and the estimation of the potential severity of fires that can develop under defined fire scenarios.

3.3.16 Equivalency.
An alternative means of providing an equal or greater degree of safety than that afforded by strict conformance to prescribed codes and standards.
3.3.17 Fire Command Center.
The principal attended or unattended room or area where the status of the detection, alarm communications, control systems, and other emergency systems is displayed and from which the system(s) can be manually controlled. [72, 2013]

3.3.18 Fire Emergency.
The existence of, or threat of, fire or the development of smoke or fumes, or any combination thereof, that demands immediate action to correct or alleviate the condition or situation. [502, 2014]

3.3.19 Fire Growth Rate.
Rate of change of the heat release rate. Some factors that affect the fire growth rate are exposure, geometry, flame spread, and fire barriers.

3.3.20 Fire Load.

3.3.20.1 Effective Fire Load.
The portion of the total fire load (in joules or Btu) under a given, specific fire scenario of a certain fuel package that would be expected to be released in a design fire incident.

3.3.20.2 Total Fire Load.
The total heat energy (in joules or Btu) of all combustibles available from the constituent materials of a certain fuel package.

3.3.21 Fire Smoke Release Rate.
Rate of smoke release for a given fire scenario expressed as a function of time \([\text{m}^2/\text{sec} \text{ (ft}^2/\text{sec})]\).

3.3.22 Flaming Dripping.
Periodic dripping of flaming material from the site of material burning or material installation.

3.3.23 Flaming Running.
Continuous dripping of flaming material leaving the site of material burning or material installation.

3.3.24 Guideway.
That portion of the fixed guideway transit or passenger rail system included within right-of-way fences, outside lines of curbs or shoulders, underground tunnels and stations, cut or fill slopes, ditches, channels, and waterways and including all appertaining structures.

3.3.25 Hazard.
Real or potential condition that can cause injury.

3.3.26 Headway.
The interval of time between the arrivals of consecutive trains at a platform in a station.

3.3.27 Heat Release Rate (HRR).
The rate at which heat energy is generated by burning. [921, 2011]

3.3.27.1 Average Heat Release Rate (HRR,180).
The average heat release rate per unit area, over the time period starting at time to ignition and ending 180 seconds later, as measured in ASTM E 1354 (kW/m²).

3.3.27.2 Fire Heat Release Rate for Ventilation Calculations.
Rate of energy release for a given fire scenario expressed as a function of time \([W \text{ (Btu/s)}]\).

3.3.28 Incident Commander (IC).
The individual responsible for all incident activities, including the development of strategies and tactics and the ordering and the release of resources. [472, 2013]

3.3.29 Noncombustible (Material).
See Section 4.7.

3.3.30 Nonmechanical Emergency Ventilation System.
A system of smoke reservoirs, smoke vents, and/or dampers that are designed to support the tenability criteria without the use of fans.

3.3.31 Occupancy.

3.3.31.1 Incidental Occupancies Within Stations.
The use of a portion of the station by others who are neither transit system employees nor passengers and where such space remains under the control of the system-operating authority.

3.3.31.2 Nonsystem Occupancy.
An occupancy not under the control of the system-operating authority.
3.3.32 Operations Control Center.
The operations center where the authority controls and coordinates the systemwide movement of passengers and trains from which communication is maintained with supervisory and operating personnel of the authority and with participating agencies when required.

3.3.33 Participating Agency.
A public, quasipublic, or private agency that has agreed to cooperate with and assist the authority during an emergency.

3.3.34 Passenger Load.
3.3.34.1 Detraining Load.
The number of passengers alighting from a train at a platform.
3.3.34.2 Entraining Load.
The number of passengers boarding a train at a platform.
3.3.34.3 Link Load.
The number of passengers traveling between two stations on board a train or trains.

3.3.35 Point of Safety.
A point of safety is one of the following: (1) an enclosed exit that leads to a public way or safe location outside the station, trainway, or vehicle; (2) an at-grade point beyond the vehicle, enclosing station, or trainway; (3) any other approved location.

3.3.36 Power Station.
An electric-generating plant for supplying electrical energy to the system.

3.3.37 Power Substation.
Location of electric equipment that does not generate electricity but receives and converts or transforms generated energy to usable electric energy.

3.3.38 Radiant Panel Index ($I_a$).
The product of the flame spread factor ($F_s$) and the heat evolution factor ($Q_s$), as determined in ASTM E 162.

3.3.39 Replace in Kind.
As applied to vehicles and facilities, to furnish with new parts or equipment of the same type but not necessarily of identical design.

3.3.40 Retrofit.
As applied to vehicles and facilities, to furnish with new parts or equipment to constitute a deliberate modification of the original design (as opposed to an overhaul or a replacement in kind).

3.3.41 Smoke Obscuration.
The reduction of light transmission by smoke, as measured by light attenuation. [270, 2013]

3.3.42 Specific Extinction Area.
A measure of smoke obscuration potential per unit mass burnt, determined as the product of the specific extinction coefficient and the volumetric mass flow rate, divided by the mass loss rate [m/kg (ft/lb)].

3.3.43 Specific Optical Density ($D_s$).
The optical density, as measured in ASTM E 662, over unit path length within a chamber of unit volume, produced from a specimen of unit surface area, that is irradiated by a heat flux of 2.5 W/cm² for a specified period of time.

3.3.44 Station.
A place designated for the purpose of loading and unloading passengers, including patron service areas and ancillary spaces associated with the same structure.

3.3.44.1 Enclosed Station.
A station or portion thereof that does not meet the definition of an open station.

3.3.44.2 * Open Station.
A station that is constructed such that it is directly open to the atmosphere and smoke and heat are allowed to disperse directly into the atmosphere.

3.3.45 Station Platform.
The area of a station immediately adjacent to a guideway, used primarily for loading and unloading passengers.

3.3.46 Structure.
3.3.46.1 Elevated Structure.
Any structure not otherwise defined as a surface or underground structure.

3.3.46.2 Surface Structure.
Any at-grade or unroofed structure other than an elevated or underground structure.

3.3.47 System.
See 3.3.52.1, Fixed Guideway Transit System, or 3.3.52.2, Passenger Rail System.

3.3.48 Tenable Environment.
An environment that permits the self-rescue or survival of occupants.

3.3.49 Tourist, Scenic, Historic, or Excursion Operations.
Railroad operations, often using antiquated equipment, that are principally intended to carry passengers traveling for pleasure purposes.

3.3.50 Track.
3.3.50.1 Storage Track.
A portion of the trainway used for temporary storage or light cleaning of trains and not intended to be used for trains occupied by passengers.

3.3.50.2 Tail Track.
A portion of dead-end trainway used for temporary storage, turn-around, or light cleaning of trains and not intended to be used for trains occupied by passengers.

3.3.51 Trainway.
That portion of the system in which the vehicles operate.

3.3.52 Transportation Systems.
3.3.52.1 Fixed Guideway Transit System.
An electrified transportation system, utilizing a fixed guideway, operating on right-of-way for the mass movement of passengers within a metropolitan area, and consisting of its fixed guideways, transit vehicles, and other rolling stock; power systems; buildings; stations; and other stationary and movable apparatus, equipment, appurtenances, and structures.

3.3.52.1.1 Automated Fixed Guideway Transit System.
A fixed guideway transit system that operates fully automated, driverless vehicles along an exclusive right-of-way.

3.3.52.2 Passenger Rail System.
A transportation system, utilizing a rail guideway, operating on right-of-way for the movement of passengers within and between metropolitan areas, and consisting of its rail guideways, passenger rail vehicles, and other rolling stock; power systems; buildings; stations; and other stationary and movable apparatus, equipment, appurtenances, and structures.

3.3.53 Vehicle.
3.3.53.1 Fixed Guideway Transit Vehicle.
An electrically propelled passenger-carrying vehicle characterized by high acceleration and braking rates for frequent starts and stops and fast passenger loading and unloading.

3.3.53.2 Passenger Rail Vehicle.
A vehicle and/or power unit running on rails used to carry passengers and crew.

### Additional Proposed Changes

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### Statement of Problem and Substantiation for Public Input

For 7.2.6, the Standard’s current mandatory text lacks a requirement to establish project tenability and time-of-tenability criteria for approval.

For A.7.2.6, the Standard’s current advisory text is focused on time-of-tenability, and both overall tenability and the breadth of other tenability considerations addressed in Annex B should be mentioned in the Annex A referral to Annex B. The proposed modifications will strengthen connection between Annex B.2 and mandatory text, to
assure that tenability criteria are established to address acoustic concerns not addressed in the current Standard.

For B.2.1.5, the Standard’s current advisory text contains undocumented maximum noise exposure limits and insufficient guidance for communication with and protection of occupants during the emergency evacuation scenario.

The proposed changes add guidance and related values for consideration in fixing project criteria that are found in other established Standards and adapted for the specific environment of this Standard, clarified with noise metrics and measurement parameters, and supported with relevant definitions added in Chapter 3 and references added in Annex H.

### Related Public Inputs for This Document

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### Submitter Information Verification

- **Submitter Full Name:** DAVID PLOTKIN
- **Organization:** AECOM
- **Street Address:**
- **City:**
- **State:**
- **Zip:**
- **Submittal Date:** Thu Jul 03 11:57:01 EDT 2014
3.3.xx Decibel. The logarithmic units associated with sound pressure level.

3.3.xx Un-weighted Decibel (dBZ). Decibel values without weighting applied.

3.3.xx A-weighted Decibel (dBA). Decibel values with weighting applied over the frequency range of 20Hz to 20kHz to reflect human hearing.

3.3.xx Sound Pressure Level. The logarithmic ratio of the root-mean squared sound pressure to the reference sound pressure ($2.0 \times 10^{-5}$ Pascals).

3.3.xx Common Intelligibility Scale (CIS). See NFPA 72-2013 Annex D.2.4.5.

3.3.xx Speech Interference Level (SIL). A calculated quantity providing a guide to the interfering effect of noise on speech intelligibility. One-fourth of the sum of the band sound pressure levels for octave-bands with normal mid-band frequencies of 500, 1000, 2000, and 4000 Hz. Unit, decibel; abbreviation, SIL.


3.3.xx Voice Communication System. An amplified paging system for speech communication, including emergency notifications and announcements.

3.3.xx Time Weighted Average (TWA). The Time Weighted Average sound level is a continuous sound level which, over a defined period, would produce the same noise dose as the varying sound level.

3.3.xx $L_{eq}$. Level equivalent, the average sound level over time on an acoustical energy basis

3.3.xx ‘Slow’. The response time of a sound level meter’s RMS detector corresponding to a rise time constant of 1 second per ANSI S1.4 and IEC 61672.

7.2.6* The tenability and time-of-tenability criteria for stations and trainways shall be established and approved. For stations, the time shall be greater than the calculated egress time used to establish egress capacity in 5.3.2.1.

A.7.2.6 Tenability criteria should consider a number of environmental conditions. The time of tenability should consider the possibility of one or more egress paths being blocked by fire or smoke (as may be demonstrated by analysis) and for other considerations that are not accounted for in the egress capacity calculations. (See B.2.3 for additional information to be considered.)

B.2.1.5 Noise Levels. Criteria for noise levels should be established for the various situations and potential exposures particular to the environments addressed by this Standard. A maximum of 115 dBA for a few seconds and a maximum of 92 dBA for the remainder of the exposure. The intent of the recommended criteria is to maintain at least a minimal level of speech intelligibility along emergency evacuation routes. This may require additional noise control measures and acoustical treatment to achieve. Exceptions taken to the recommended noise levels for reasons of cost and feasibility should be as few and as slight as reasonably possible. For example, local area exceptions to the recommended acoustic criteria may be required to be applied for defined limited distances along the evacuation path that are near active noise sources. Other means of providing emergency evacuation guidance using acoustic, non-acoustic or combined methods may be considered.

(a) Noise levels should not exceed the following:

The sound pressure level from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface, should not exceed 94 dBA $L_{eq}$ ‘slow’ for a period of 1-hour, and should at no time exceed 140

The sound pressure level from all active systems measured where staff would be present for maintenance and testing and where hearing protection is not available should not exceed 85 dBA TWA ‘slow’ for a period of 8-hours, and should at no time exceed 140 dBZ Peak. [ref: 29 CFR 1910.95 (OSHA)]

(b) Where reliance upon unamplified speech is used as part of the emergency response:

The sound interference level (SIL) from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface should not exceed 78 dBZ L<sub>eq</sub> ‘slow’ over any period of 1 minute, using the arithmetic average of un-weighted sound pressure level in the 500, 1000, 2000 and 4000 Hz octave bands.

(c) For intelligible communication between emergency evacuation responders and the public where reliance upon amplified speech is used as part of the emergency response within a station:

The sound pressure level from all active systems measured inside a station along the path of evacuation during the emergency response at any point five (5) feet above the walking surface where a voice communication system is intended to be used should not exceed the higher of 70 dBA L<sub>eq</sub> ‘slow’ measured over any 1 minute period or 10 dB below the measured voice communication system sound pressure level in the octave bands greater than 63 Hz with a steady-state red noise input signal set to the maximum A-weighted setting of the voice communication system (if the voice communication system has an ambient sensing microphone).

The speech intelligibility of voice communication systems under the same conditions and for the same spaces, should achieve a measured STI of not less than 0.45 (0.65 CIS), and an average STI of not less than 0.5 (0.7 CIS) as per NFPA 72-2013 Annex D.2.4.1. Refer to NFPA 72-2013 Annex D for further information on Speech Intelligibility for voice communication systems.

The STI criterion is more stringent than the noise level limit and may require additional noise control measures and acoustical treatment to achieve.

(d) Where reliance upon amplified speech is used as part of the emergency response within a tunnel:

Where a voice communication system is intended to be used within a tunnel, the sound pressure level from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface should not exceed 75 dBA L<sub>eq</sub> ‘slow’ measured over any period of 1 minute.

The speech intelligibility of fixed voice communication systems under the same conditions and for the same spaces, should achieve a measured STI of not less than 0.45 (0.65 CIS), and an average STI of not less than 0.5 (0.7 CIS) as per NFPA 72-2013 Annex D.2.4.1. Refer to NFPA 72-2013 Annex D for further information on Speech Intelligibility for voice communication systems.

The STI criterion is more stringent than the noise level limit and may require additional noise control measures and acoustical treatment to achieve.

H.1.2.8 ISO Publications [and renumber]

H.1.2.9 OSHA Publications [and renumber]


H.1.2.11 Other Publications


Substantiation

For 7.2.6, the Standard’s current mandatory text lacks a requirement to establish project tenability and time-of-tenability criteria for approval.

For A.7.2.6, the Standard’s current advisory text is focused on time-of-tenability, and both overall tenability and the breadth of other tenability considerations addressed in Annex B should be mentioned in the Annex A referral to Annex B. The proposed modifications will strengthen connection between Annex B.2 and mandatory text, to assure that tenability criteria are established to address acoustic concerns not addressed in the current Standard.

For B.2.1.5, the Standard’s current advisory text contains undocumented maximum noise exposure limits and insufficient guidance for communication with and protection of occupants during the emergency evacuation scenario.

The proposed changes add guidance and related values for consideration in fixing project criteria that are found in other established Standards and adapted for the specific environment of this Standard, clarified with noise metrics and measurement parameters, and supported with relevant definitions added in Chapter 3 and references added in Annex H.
3.3.6 Building.
Any structure or group of structures in which fixed guideway transit and/or passenger rail vehicles are stored or maintained, including those in which inspection and service functions are performed, and other ancillary structures, such as substations and air-conditioning or ventilation facilities.

Statement of Problem and Substantiation for Public Input
The proposed change eliminates a specific definition for a term that commonly, and as used elsewhere in the Standard, has a wider reference.

Submitter Information Verification
Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Mon Jul 07 15:32:27 EDT 2014
3.3.7 Carbon Monoxide.
Annex B suggests carbon monoxide (CO) concentration criteria as a function of exposure time. CO is a constituent of the fire product gas emitted during a fire. The CO yield rate is defined as the mass (weight) of CO emitted per mass (weight) of the fuel consumed (units: g of CO emitted per g of fuel burnt or lbs of CO emitted per lb of fuel burnt).

3.3.8 Fire Carbon Monoxide Release Rate.
Rate of carbon monoxide release for a given fire scenario expressed as a function of time (g/s or lbs/s).

3.3.9 Fire Profile.
For a given fire scenario, the fire carbon monoxide, heat release, smoke and soot release rates expressed as a function of time from the initiation of the fire until at least the end of the time of tenability.

3.3.10 Fire Scenario.
A set of conditions that defines the development of a fire, the spread of combustion products in a fixed guideway transit or passenger rail system, the reaction of people to the fire and the effects of the products of combustion. [101, 2012] modified.

3.3.11 Design Fire Scenario.
A fire scenario selected for the evaluation of a proposed design. [101, 2012]

3.3.12 Fire Soot Release Rate.
Rate of soot release for a given fire scenario expressed as a function of time (g/s or lbs/s).

3.3.13 Smoke.
The airborne solid and liquid particulates and gases evolved when a material undergoes pyrolysis or combustion together with the quantity of air that is entrained or otherwise mixed into the mass. [92, 2012]

3.3.14 Soot.
A constituent of the fire product gas and is the carbon particles emitted during a fire and is the primary cause of obscuration from a fire. The soot yield rate is defined as the mass (weight) of soot emitted per mass (weight) of the fuel consumed (units: g of soot emitted per g of fuel burnt or lbs of soot emitted per lb of fuel burnt).

Statement of Problem and Substantiation for Public Input
This is part of a Public Input providing minimum requirements concerning the selection of design fires. New definitions are added in Section 3.

Related Public Inputs for This Document

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Submitter Information Verification
Submitter Full Name: Silas Li
Organization: Parsons Brinckerhoff, Inc.
Street Address:
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<tr>
<td><strong>Submittal Date:</strong></td>
<td><strong>Thu Jul 03 14:40:32 EDT 2014</strong></td>
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Public Input No. 52-NFPA 130-2014 [ New Section after 3.3.21 ]

| Fire separation. A horizontal or vertical fire resistance–rated assembly of materials that have protected openings and are designed to restrict the spread of fire. [NFPA 45] |

Statement of Problem and Substantiation for Public Input

The term or the concept of fire separation is used in many sections of NFPA 130. However it is not defined in the standard but it is defined in one NFPA document, namely NFPA 45. Therefore, in the spirit of having consistency of definitions within the NFPA system, it is recommended that NFPA 130 extracts the definition from NFPA 45. The concept really means "separated by a fire resistance rated assembly or wall".

Submitter Information Verification

<table>
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<tr>
<th>Submitter Full Name:</th>
<th>Marcelo Hirschler</th>
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<tr>
<td>Organization:</td>
<td>GBH International</td>
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<tr>
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<td>Submittal Date:</td>
<td>Mon Jun 30 18:17:18 EDT 2014</td>
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3.3.21 Fire Smoke Release Rate.
Rate of smoke release for a given fire scenario or a given fire test; it is expressed in terms of a surface area as a function of time [in m²/sec (ft²/sec)].

Statement of Problem and Substantiation for Public Input
Note that the integral of the smoke release rate is the total smoke released and that is a requirement contained in several locations in the standard, including wherever NFPA 286 and UL 1685 are the fire tests mentioned: 5.2.5.1, 6.2.7.2, 6.3.4.3, 8.6.7.1.1.1 and 12.2.1. The term smoke release rate (together with heat release rate) is also a part of the title of a referenced standard, namely ASTM E1354.

Submitter Information Verification
Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 30 18:26:42 EDT 2014
Public Input No. 17-NFPA 130-2014 [ New Section after 3.3.23 ]

Green Track
The intentional placement and maintenance of non-combustible vegetation within a trainway.

Statement of Problem and Substantiation for Public Input
This definition is needed for Public Input No. 16

Related Public Inputs for This Document

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Submitter Information Verification

Submitter Full Name: Charles Giblin III
Organization: Maryland State Fire Marshal’s Office
Affiliation: International Fire Marshal’s Association
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed May 28 13:35:09 EDT 2014
3.3.24 Guideway.
That portion of the fixed guideway transit or passenger rail system included within right-of-way fences, outside lines of curbs or shoulders, underground tunnels and stations, cut or fill slopes, ditches, channels, and waterways and including the trainway and all appertaining structures.

Statement of Problem and Substantiation for Public Input
The proposed change is to clarify that the trainway is a part of the guideway.

Submitter Information Verification
Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 14:55:38 EDT 2014
3.3.27.2 - **Fire Heat Release Rate for Ventilation Calculations**

Rate of energy release for a given fire scenario or fire test, expressed as a function of time \((W); it can be expressed in absolute terms (in large scale fire tests or in fire modeling, typically in W or Btu/s) \) or in relative terms, per unit area (in small scale fire tests, typically in kW/m²).

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

The concept of heat release rate is the same whether it is used for a fire test or a fire modeling project. Typically small scale fire tests, such as ASTM E1354, cone calorimeter, require measurements of heat release rate per unit area and large scale fire tests or fire modeling require absolute measurements, in W or BTU/s. The term is being renamed "fire heat release rate" to make it unique to NFPA 130, since no other NFPA document has that term. The add-on "for ventilation calculations" is unnecessary as it limits the concept.

**Submitter Information Verification**

- **Submitter Full Name:** Marcelo Hirschler
- **Organization:** GBH International
- **Street Address:**
- **City:**
- **State:**
- **Zip:**
- **Submittal Date:** Mon Jun 30 18:37:16 EDT 2014
3.3.42 Specific Extinction Area.
A measure of smoke obscuration potential per unit mass burnt, determined as the product of the specific extinction coefficient and the volumetric mass flow rate, divided by the mass loss rate \([m^2/kg \ (ft^2/lb)]\).

Statement of Problem and Substantiation for Public Input

Correct the units based on ASTM E1354.

Submitter Information Verification

Submitter Full Name: Silas Li
Organization: Parsons Brinckerhoff, Inc.
Street Address: City: State: Zip:
Submittal Date: Thu Jul 03 14:20:18 EDT 2014
Public Input No. 93-NFPA 130-2014 [ Section No. 3.3.44.1 ]

3.3.44.1 Enclosed Station
A station or guideway or portion thereof that does not meet the definition of an open station.

Statement of Problem and Substantiation for Public Input

The proposed change is to relocate the term "enclosed" as a general definition that is applicable to stations and guideways.

Submitter Information Verification

Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 15:05:48 EDT 2014
Open Station. A station, guideway or portion thereof, that is constructed such that it is directly open to the atmosphere and smoke and heat are allowed to disperse directly into the atmosphere.

Statement of Problem and Substantiation for Public Input

The proposed change is to relocate the term "open" as a general definition that is applicable to stations and guideways.

Submitter Information Verification

Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address:
City: 
State: 
Zip: 
Submittal Date: Mon Jul 07 15:07:18 EDT 2014
Public Input No. 92-NFPA 130-2014 [ Section No. 3.3.46 ]

3.3.46 - Structure.
  3.3.46.1 - Elevated Structure.
  Any structure not otherwise defined as a surface or underground structure.
  3.3.46.2 - Surface Structure.
  Any at-grade or unroofed structure other than an elevated or underground structure.

Statement of Problem and Substantiation for Public Input

The proposed revision is to eliminate definitions for terms that are not used in the standard.

Submitter Information Verification

Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Mon Jul 07 14:58:17 EDT 2014
A electrified transportation system, utilizing a fixed guideway, operating on right-of-way for the mass movement of passengers within a metropolitan area, and consisting of its fixed guideways, transit vehicles, and other rolling stock; power systems; buildings control, maintenance and storage facilities; stations; and other stationary and movable apparatus, equipment, appurtenances, and structures.

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

The proposed change is to eliminate the specific and non-common use of the term 'building' and to replace that with terms representing the facilities that are intended by the reference.

**Submitter Information Verification**

- **Submitter Full Name:** Katherine Fagerlund
- **Organization:** Sereca Fire Consulting Ltd.
- **Street Address:**
- **City:**
- **State:**
- **Zip:**
- **Submittal Date:** Mon Jul 07 15:40:26 EDT 2014
### Passage Rail System.

A transportation system, utilizing a rail guideway, operating on right-of-way for the movement of passengers within and between metropolitan areas, and consisting of: its rail guideways, passenger rail vehicles, and other rolling stock; power systems; **buildings control, maintenance and storage facilities**; stations; and other stationary and movable apparatus, equipment, appurtenances, and structures.

### Statement of Problem and Substantiation for Public Input

The proposed change is to eliminate the specific and non-common use of the term 'building' and to replace that with terms representing the facilities that are intended by the reference.

### Submitter Information Verification

**Submitter Full Name:** Katherine Fagerlund  
**Organization:** Sereca Fire Consulting Ltd.  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Mon Jul 07 15:35:25 EDT 2014
General Fire Safety Concepts

Statement of Problem and Substantiation for Public Input

The proposed change is to clarify the scope of Chapter 4 and to provide better visibility for the chapter as providing fundamental information regarding the intended design objectives contained in other chapters.

Submitter Information Verification

Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Mon Jul 07 15:10:06 EDT 2014
Shared Use by Freight Systems.

Where passenger and freight systems are operated concurrently through or adjacent to stations and trainways, the design of the station and trainway fire-life safety and fire protection systems shall consider the hazards associated with both uses, as approved.

Statement of Problem and Substantiation for Public Input

The proposed change is to clarify the intended re-ordering of existing sections 4.5 and 4.6 in the Standard.

Submitter Information Verification

Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 14:12:36 EDT 2014
5.1.2.1
The requirements in this chapter shall supplement the requirements of the locally applicable codes for the design and construction of stations.

Statement of Problem and Substantiation for Public Input

Guidance is provided in NFPA 780, Standard for the Installation of Lightning Protection Systems, for determining the need for lightning protection.

Submitter Information Verification

Submitter Full Name: Mark Morgan
Organization: East Coast Lightning Equipment
Affiliation: NFPA 780 References task group
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 15:25:45 EDT 2014
5.2.5.1
Materials used as interior wall and ceiling finish in enclosed stations shall be noncombustible except as permitted in comply with one of the following requirements:

- Except as required for materials listed in (2), materials exhibiting a flame spread index not exceeding 25 and a smoke developed index not exceeding 450 when tested in accordance with ASTM E 84 shall be permitted as interior wall and ceiling finish in enclosed stations.

The following materials shall not be used as interior wall or ceiling finish, whether exposed or covered by a textile or vinyl facing, unless they are

1. The materials shall be noncombustible in accordance with section 4.7

2. The materials shall comply with the requirements of (3) when tested in accordance with NFPA 286 and meet the requirements of:

   (3)
   - Foam plastic insulation
   - Textile wall or ceiling coverings
   - Polypropylene
   - High density polyethylene

Materials tested in accordance with NFPA 286, and meeting shall meet the following requirements shall be permitted as interior wall and ceiling finish in enclosed stations:

(a) Flames shall not spread to the ceiling during the 40 kW (135 kBtu/hr) exposure.
(b) Flames shall not spread to the outer extremities of the sample on any wall or ceiling.
(c) Flashover, as described in NFPA 286, shall not occur.
(d) The peak heat release rate shall not exceed 800 kW (2730 kBtu/hr).
(e) The total smoke released throughout the test shall not exceed 1000 m² (10,764 ft²).

4. The materials shall comply with a flame spread index not exceeding 25 and a smoke developed index not exceeding 450 when tested in accordance with ASTM E84, except that the materials in (5) shall be required to be tested in accordance with NFPA 286 and meet the requirements of (3).

5. The following materials shall be permitted to be used as interior wall and ceiling materials if they are tested in accordance with NFPA 286 and comply with the requirements of (3):

(a) Foam plastic insulation, whether exposed or covered by a textile or vinyl facing.
(b) Textile wall or ceiling coverings.
(c) Polypropylene.
(d) High density polyethylene.

6. Other interior wall and ceiling finish materials in enclosed stations shall comply with the requirements of Class A materials in accordance with section 10.2 of NFPA 101.
Statement of Problem and Substantiation for Public Input

This is simply clarification because the section somehow became garbled. The logic is the following.

1. The first possible classification is the use of noncombustible materials as interior wall and ceiling finish materials.
2. The other options are, first testing to NFPA 286 (room-corner fire test) and any material is allowed to be tested to this test.
3. The requirements for being acceptable when testing to NFPA 286 are those indicated next.
4. Most materials (except for the list of 4 in the next section) are allowed to be fire tested to ASTM E84 instead of testing to NFPA 286 (Steiner tunnel test).
5. Four materials are not safe when simply tested to ASTM E84 and they need to be tested to NFPA 286 always.
6. In the exclusive case of foam plastic insulation, it is important to make it clear that placing a textile or vinyl facing is not a way to "allow" it to be used without testing to NFPA 286. The other materials are never covered by facings because they have an attractive finish.
7. The new section is being added so there is no longer any need to describe materials individually.

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 01 08:43:22 EDT 2014
5.2.6.2.1 Permanent rubbish containers in the station shall be manufactured of noncombustible materials.

5.2.6.2.2 Rubbish containers that are used in the station on a temporary basis (e.g., during cleaning operations) shall be manufactured of noncombustible materials or of materials that comply with a peak heat release rate not exceeding 300 kW/m² (26.4 Btu/ft²·sec) when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m² (4.4 Btu/ft²·sec), in the horizontal orientation.

Statement of Problem and Substantiation for Public Input

This brings the recommendation from the annex into the mandatory section of the standard to avoid the use of highly flammable materials for rubbish containers. The requirements are consistent with the requirements for rubbish containers included in every relevant section of the new edition of the International Fire Code (IFC), namely sections dealing with large rubbish containers in the proximity of all structures, containers in all types of institutional occupancies, college and university dormitories, motor fuel dispensing facilities, repair garages, construction and demolition sites and marinas. The reason is that standard combustible rubbish containers are normally made of very flammable thermoplastic materials, such as polypropylene, which can lead to flashover. In one example, a 13 gallon plastic rubbish container gave 13 Megajoules soon after ignition. Similar requirements are also contained in NFPA 1 and details of associated problems can be found in the annex of NFPA 1.

Related Public Inputs for This Document

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Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 30 13:02:46 EDT 2014
5.2.7 Insulation

5.2.7.1 Insulation in concealed spaces. Insulation in concealed spaces shall comply with one of the following:

5.2.7.1.1 Insulation in concealed spaces shall comply with a flame spread index not exceeding 25 and a smoke developed index not exceeding 450 when tested in accordance with ASTM E84, except as indicated in 5.2.7.1.2 through 5.2.7.1.4.

5.2.7.1.2 Foam plastic insulation shall comply with a flame spread index not exceeding 75 and a smoke developed index not exceeding 450 when tested in accordance with ASTM E84 and shall also be separated from the interior of the station by a thermal barrier meeting the requirements of NFPA 275, Standard Method of Fire Tests for the Evaluation of Thermal Barriers.

5.2.7.1.3 Cellulose loose fill insulation shall comply with the following:

5.2.7.1.3.1 It shall exhibit a critical radiant flux not exceeding 0.12 W/cm² when tested in accordance with ASTM E970, Standard Test Method for Critical Radiant Flux of Exposed Attic Floor Insulation Using a Radiant Heat Energy Source, or with CPSC 16 CFR Part 1209.6

5.2.7.1.3.2 It shall have no evidence of flaming combustion and a weight loss not exceeding 15% when tested in accordance with the smoldering combustion test in ASTM C739, Standard Specification for Cellulosic Fiber Loose-Fill Thermal Insulation, or in CPSC 16 CFR Part 1209.7

5.2.7.1.3.3 It shall exhibit a smoke developed index not exceeding 450 when tested in accordance with CAN/ULC S102.2 (Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies).

5.2.7.1.4 Duct and pipe insulation and duct and pipe coverings and linings in plenums shall comply with the requirements of NFPA 90A (Standard for the Installation of Air-Conditioning and Ventilating Systems).

5.2.7.2 Exposed insulation. Exposed insulation shall comply with the requirements of one of the following:

5.2.7.2.1 Exposed insulation shall be tested in accordance with NFPA 286 and meet all of the following requirements:

(a) Flames shall not spread to the ceiling during the 40 kW (135 kBTU/hr) exposure.
(b) Flames shall not spread to the outer extremities of the sample on any wall or ceiling.
(c) Flashover, as described in NFPA 286, shall not occur.
(d) The peak heat release rate shall not exceed 800 kW (2730 kBTU/hr).
(e) The total smoke released throughout the test shall not exceed 1000 m² (10,764 ft²).

5.2.7.2.2 Exposed insulation, other than foam plastic insulation or loose fill cellulose insulation, shall be tested in accordance with ASTM E84 and exhibit a flame spread index not exceeding 25 and a smoke developed index not exceeding 450.

5.2.7.2.3 Foam plastic insulation shall be permitted to be used when complying with any one of the following:

(a) When installed in accordance with 5.2.7.1.2
(b) When complying with 5.2.7.2.1
(c) When it has been tested to FM 4880 (Approval Standard for Class 1 Insulated Wall or Wall and Roof/Ceiling Panels; Plastic Interior Finish Materials; Plastic Exterior Building Panels; Wall/Ceiling Coating Systems; Interior or Exterior Finish Systems) and has complied with the requirements and has also been tested to NFPA 286 and the total smoke released during that test has not exceeded 1000 m² (10764 ft²).
(d) When it has been tested to UL 1040 (Standard for Fire Test of Insulated Wall Construction) and has complied with the requirements and has also been tested to NFPA 286 and the total smoke released during that test has not exceeded 1000 m² (10764 ft²).
(e) When it has been tested to UL 1715 (Standard for Fire Test of Interior Finish Material) and has complied with the requirements and the total smoke including released during the test has not exceeded 1000 m² (10764 ft²).
5.2.7.2.4 Cellulose loose fill insulation shall not be permitted to be used as exposed insulation. Also add ASTM C739 (2011), ASTM E970 (2014), FM 4880, UL 1040, UL 1715 and ULC S102.2 into chapter 2 on referenced standards.

Statement of Problem and Substantiation for Public Input

This section fills a gap missing in NFPA 130. This brings into NFPA 130 all the requirements for insulation (exposed or concealed) that are included in codes (NFPA 5000 or IBC) without direct reference to the code itself. The actual ASTM test standards are included as well as the CPSC requirements for use internationally.

The referenced standards need to be added to chapter 2.

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler  
Organization: GBH International  
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Tue Jul 01 09:14:02 EDT 2014
5.3.9 Horizontal Exits

5.3.9.1 Horizontal exits compliant with NFPA 101 shall be permitted for up to 100 percent of the number of horizontal exits of exits and required egress capacity provided that not more than 50 percent of the number and required capacity is into a single building.

Statement of Problem and Substantiation for Public Input

The proposed revisions are editorial in nature. The first is the elimination of a sub paragraph when only one subparagraph exists. This is consistent with the NFPA Manual of Style. The Annex note is retained and attached to the paragraph (5.3.9). In existing 5.3.9.1, the word "horizontal" is proposed to be deleted since the intent would seem to be that all exits can be horizontal exits.

Submitter Information Verification

Submitter Full Name: William Koffel
Organization: Koffel Associates, Inc.
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Mon Jul 07 13:56:36 EDT 2014
Public Input No. 106-NFPA 130-2014 [ New Section after 5.3.10 ]

5.3.10.1
Guards shall not be required along the trainway side of platforms.

Statement of Problem and Substantiation for Public Input
The proposed change is to add clarification that guards are not required at platform edges facing the trainway.

Submitter Information Verification
Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 15:43:02 EDT 2014
5.3.10.2
Tactile and visual warning shall be provided along the trainway side of platforms where the platform is more than 760 mm (30 in.) above the surface of the adjacent trainway except where such edges are protected by platform edge screens or doors.

Statement of Problem and Substantiation for Public Input

The proposed change is to add requirements for tactile and visual warning at unprotected platform edges adjacent to the trainway. Tactile/visual warning is commonly installed but has not previously been stipulated in NFPA 130.

Submitter Information Verification

Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 15:48:59 EDT 2014
5.3.10 Platform Screen and Edge Doors Provisions.

Horizontal sliding platform screen or platform edge doors shall be permitted to separate the platform from the trainway in stations, provided that the following criteria are met:

1. The doors permit emergency egress from the train to the platform regardless of the stopping position of the train.
2. The doors provide egress when a force not exceeding 220 N (50 lb) is applied from the train side of the doors.
3. The doors are designed to withstand positive and negative pressures caused by passing trains.

Statement of Problem and Substantiation for Public Input

The title of the Section is revised to reflect larger scope. The re-numbering of 5.3.10.1 to 5.3.10.3 is also submitted as Public Input No. 107.

Submitter Information Verification

Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 20:13:28 EDT 2014
5.4.2.1  
Stations equipped with fire alarm devices shall be protected by a proprietary supervising station fire alarm system as defined in, designed, installed and maintained in accordance with NFPA 72.

Statement of Problem and Substantiation for Public Input

Current language calls for a "proprietary supervising station alarm system", this is one subset of a fire alarm system and may not work for all applications. This application requires full time personnel who are trained around the clock to monitor the fire alarm system activity. Some stations may need a local alarm system that is monitored by an off site monitoring agency. This revised language provides flexibility and does not impact cost.

Submitter Information Verification

Submitter Full Name: Daniel Finnegan
Organization: Siemens Industry, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 14:23:07 EDT 2014
Public Input No. 87-NFPA 130-2014 [ New Section after 5.4.2.7 ]

TITLE OF NEW CONTENT
Type your content here ...

5.4.2.8 Listed smoke detection shall be provided in all electrical switchgear/transformer rooms and IT Data control rooms’

Statement of Problem and Substantiation for Public Input

This statement will clearly require early warning smoke detection in key critical areas in the transit stations. These areas are a source of fires; generally not occupied and early warning detection with fire sprinklers will protect life, property and operation of the transit systems. Research documentation on the technical value of smoke detection with fire sprinklers at request. (University of Maryland Dr. Milke)

Submitter Information Verification

Submitter Full Name: Daniel Finnegan
Organization: Siemens Industry, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 14:28:56 EDT 2014
5.4.3.3
The notification devices, Notification appliances, shall be placed in approved locations at each facility provided in accordance with NFPA 72.

Statement of Problem and Substantiation for Public Input

Requiring that notification devices shall be provided at approved locations provides essentially no guidance or criteria to the designer of the system. The proposed language requires compliance with NFPA 72 which will address issues such as audibility and visibility. If the intent is to permit the omission of alarm notification appliances at certain locations, additional language can be provided to permit the omission of alarm notification appliances where approved by the AHJ.

Submitter Information Verification

Submitter Full Name: William Koffel
Organization: Koffel Associates, Inc.
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Mon Jul 07 14:15:50 EDT 2014
Public Input No. 7-NFPA 130-2014 [ New Section after 5.4.3.5 ]

**Title of New Content**

Type your content here ... A two-way radio communication enhancement system shall be installed in accordance with NFPA 72.

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

Two-way radio communication enhancement systems are typically installed for this type of project. By adding this new section, it provides the design team and the AHJ a reference point that states these types of systems shall be installed in accordance with NFPA 72.

**Submitter Information Verification**

Submitter Full Name: Joe McElvaney  
Organization: Phoenix Fire Department  
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Fri Feb 07 15:01:23 EST 2014
Statement of Problem and Substantiation for Public Input

The proposed change is to clarify that the chapter addresses all aspects of guideways, not just the trainway portion.

Submitter Information Verification

Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 14:53:16 EDT 2014
Public Input No. 49-NFPA 130-2014 [ Section No. 6.2.7 ]

6.2.7 Coverboard or Protective Material.

6.2.7.1 Coverboard or protective material shall comply with section 6.6.7.1.1 or with section 6.2.7.1.2.

6.2.7.1.1 Coverboard or protective material shall have a flame spread index of not more than 25 and a smoke developed index not exceeding 450 when tested in accordance with ASTM E 84.

6.2.7.1.2 Coverboard protective material tested in accordance with NFPA 286 shall comply with the following:

(1) Flames shall not spread to the ceiling during the 40 kW (135 kBTU/hr) exposure.

(2) Flames shall not spread to the outer extremities of the sample on any test room wall or ceiling.

(3) Flashover as described in NFPA 286 shall not occur.

(4) The peak heat release rate throughout the test shall not exceed 800 kW (2730 kBTU/hr).

(5) The total smoke released throughout the test shall not exceed 1000 m² (10,764 ft²).

Statement of Problem and Substantiation for Public Input

This is simple clarification to point out that the testing to ASTM E84 or to NFPA 286 are equally valid options. As stated in the 2014 standard the user does not get to the section on NFPA 286.

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 30 12:54:25 EDT 2014
Green Track
The type, use, and design of green track shall be approved where permitted by the AHJ.
The design of green track shall be based upon a fire hazard analysis of environmental factors.

Additional Proposed Changes

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description</th>
<th>Approved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter_3_definition_for_green_track.docx</td>
<td>This definition would need to be added to the standard as there is no Miriam-Webster definition available.</td>
<td></td>
</tr>
</tbody>
</table>

Statement of Problem and Substantiation for Public Input

With an increased focus on sustainable and "green" design green track is being considered for portions of urban light rail right-of-ways. Currently the Standard provides no guidance for such an arrangement and leaves the AHJ with little code backing to require research or substantiation for such a project. This proposal is simply a place to start the committee’s input on green track installations. This section does not seek to specifically allow or prohibit such installation, however it will give the AHJ the authority to make informed, educated decisions on its use based upon a reasonable risk assessment.

Related Public Inputs for This Document

<table>
<thead>
<tr>
<th>Related Input</th>
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<tr>
<td>Public Input No. 17-NFPA 130-2014 [New Section after 3.3.23]</td>
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</table>

Submitter Information Verification

Submitter Full Name: Charles Giblin III
Organization: Maryland State Fire Marshal's Office
Affiliation: International Fire Marshal's Association
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed May 28 13:23:40 EDT 2014
Chapter 3 definition for green track:

The intentional placement and maintenance of non-combustible vegetation within a trainway.
Public Input No. 48-NFPA 130-2014 [ Section No. 6.2.8 ]

6.2.8 Rail Ties.
Rail ties shall comply with one of the following requirements.

6.2.8.1 Rail ties used in enclosed locations shall be noncombustible materials, in accordance with section 4.7.

6.2.8.2 Rail ties used outdoors at switch or crossover locations shall be made of materials that comply with one of the following:

1. Materials that comply with 6.2.8.1 or shall be fire–retardant.
2. Fire–retardant treated wood in accordance with NFPA 703.

6.2.8.3 Rail ties and tie blocks in enclosed track sections shall be permitted to be of wood.

3. Wood materials that exhibit a flame spread index of not more than 75 when tested in accordance with ASTM E84.
4. Plastic composite materials that comply with the requirements of ASTM D7568, Standard Specification for Polyethylene-Based Structural-Grade Plastic Lumber for Outdoor Applications, and exhibit a flame spread index of not more than 75 in accordance with ASTM E84.
5. Wood encased in concrete such that only the top surface is exposed.

6.2.8.3 Rail ties used outdoors at locations other than switch or crossover locations shall comply with one of the following:

1. Materials that comply with 6.8.1 or 6.8.2.
2. Wood materials.
3. Plastic composite materials that comply with the requirements of ASTM D7568.

Statement of Problem and Substantiation for Public Input

There is no justification why rail ties used at locations other than enclosed locations need to have requirements with severe restrictive fire performance. In fact it is common to see preservative-treated wood used for rail ties everywhere. Therefore the NFPA 130 standard should be clear that there are three levels of fire performance required: (a) enclosed locations, (b) switch and crossover locations and (c) all other locations.

In switch and crossover locations there is a need for added fire test requirements because of the potential for ignition via sparks at these locations. It has been shown that wood (or plastic lumber) materials with added fire performance can be developed and such materials will help address the added fire safety problem.

Rail ties outdoors do not have a fire safety issue and can be made of wood or of plastic lumber materials provided the plastic lumber materials meet the recent specification that requires the added structural properties, that was developed by ASTM for that purpose (ASTM D7568). The fire performance of the plastic lumber materials that meet ASTM D7568 is required to be the same as that of wood materials: 200 flame spread index in ASTM E84.

It has also been shown that plastic lumber materials that comply with ASTM D7568 have structural performance that is at least as good as that of wood materials. They are widely used by the US army for rail ties in areas (such as bridges) where tanks cross, as is the case in Fort Bragg, for example. Some web sites showing the plastic materials in use follow:

http://www.youtube.com/watch?v=2srE7muq-Hk
http://www.tietek.net/
The proposed language would require that both the wood and plastic lumber materials used at switch and crossover locations have to exhibit a better than normal flame spread index (75 or Class B) instead of 200 or Class C as is normally required.

Submitter Information Verification

**Submitter Full Name:** Marcelo Hirschler  
**Organization:** GBH International  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Fri Jun 27 18:59:35 EDT 2014
**Public Input No. 86-NFPA 130-2014 [ Section No. 6.2.8 ]**

**6.2.8 Rail Ties.**

Rail ties shall comply with one of the following requirements.

**6.2.8.1 Rail ties used in enclosed locations shall be noncombustible materials in accordance with Section 4.**

**6.2.8.2 Rail ties used outdoors at switch or crossover locations shall be made of materials that comply with one of the following:**

1. **Materials that comply with 6.2.8.1**
   or shall be fire-retardant treated
   
   (1)

2. **Pressure-treated fire-retardant treated wood in accordance with NFPA 703.**

**6.2.8.3 Rail ties and tie blocks in enclosed track sections shall be permitted to be of wood**

1. **Pressure-treated wood materials that exhibit a flame spread index of not more that 75 when tested in accordance with ASTM E84.**

2. **Pressure-treated wood materials encased in concrete such that only the top surface is exposed.**

**6.2.8.3 Rail ties used outdoors at locations other than switch or crossover locations shall comply with one of the following:**

1. **Materials that comply with 6.2.8.1 or 6.2.8.2.**

2. **Pressure-treated wood materials.**

**Additional Proposed Changes**

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<th>Description</th>
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<td>130 code change July2014</td>
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</table>

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

This should assist in clarifying where pressure preservative treated and pressure fire-retardant treated wood materials may be used in key locations in a rail bed.
There are current pressure preservative treated materials for this industrial/railroad application that exhibit fire retardant properties and this would assist in providing those agencies with guidance on where they may be used.

**Submitter Information Verification**

Submitter Full Name: Kristen Owen
Organization: Lonza Wood Protection
Street Address:
City: State: Zip:
Submittal Date: Mon Jul 07 14:26:32 EDT 2014
3.3.9 Computational Fluid Dynamics. A solution of fundamental
equations of fluid flow using computer techniques allowing
the engineer to identify velocities, pressures, temperatures, and
so forth.

3.3.10 Concours. Intermediate level(s) or area(s) connect-
ing a station platform(s) to a public way via stairs, escalators, or
corridors.

3.3.11 Critical Radiant Flux. The level of incident radiant heat
energy in units of W/cm² on a floor covering system at the most
distant flameout point. [253, 2006]

3.3.12 Critical Velocity. The minimum steady-state velocity of
the ventilation airflow moving toward the fire within a tunnel
or passageway that is required to prevent backlayering at the
fire site.

3.3.13 Emergency Procedures Plan. A plan that is developed
by the authority with the cooperation of all participating a-
genies and that details specific actions required by all those
who will respond during an emergency.

3.3.14 Engineering Analysis/Fire Hazard Analysis. An analysis
that evaluates all the various factors that affect the fire safety/
life safety of the system or component.

3.3.15 Equivalency. An alternative means of providing an
equal or greater degree of safety than that afforded by strict
conformance to prescribed codes and standards.

3.3.16 Fire Command Center. The principal attended or un-
attended location where the status of the detection, alarm
communications, and control systems is displayed and from
which the system(s) can be manually controlled. [72, 2010]

3.3.17 Fire Emergency. The existence of, or threat of, fire or
the development of smoke or fumes, or any combination
thereof, that demands immediate action to correct or alleviate
the condition or situation. [502, 2008]

3.3.18 Fire Growth Rate. Rate of change of the heat release
rate. Some factors that affect the fire growth rate are exposure,
gallery, flame spread, and fire barriers.

3.3.19 Fire Load.

3.3.19.1 Effective Fire Load. The portion of the total fire
load under a given, specific fire scenario of a certain fuel pack-
age that would be expected to be released in a design fire
incident (units: joules or Btu). This can include transit
and/or passenger rail vehicle(s), luggage, fuel, and/or ways-
side facilities or structures, that, because of the fuel package
configuration, separation, and combustion characteristics,
would be expected to be released in a design fire incident.

3.3.19.2 Total Fire Load. The total heat energy of all com-
bustible available from the constituent materials of a certain
fuel package (units: joules or Btu). This can include a transit
and/or passenger rail vehicle(s), luggage, fuel, and/or ways-
side facilities or structures.

3.3.20 Fire Smoke Release Rate. Rate of smoke release for a
given fire scenario expressed as a function of time (units: m³/sec
or ft³/sec).

3.3.21 Flaming Dripping. Periodic dripping of flaming mate-
rial from the site of material burning or material installation.

3.3.22 Flaming Running. Continuous flaming material leav-
ing the site of material burning or material installation.

3.3.23 Guideway. That portion of the transit or passenger rail
line included within right-of-way fences, outside lines of curbs
or shoulders, underground tunnels and stations, cut or fill
slopes, ditches, channels, and waterways, and including all ap-
pending structures.

3.3.24 Hazard. Real or potential condition that can cause
injury.

3.3.25 Headway. The interval of time between the arrivals of
consecutive trains at a platform in a station.

3.3.26 Heat Release Rate (HRR). The rate at which heat en-
ergy is generated by burning. [921, 2008]

3.3.26.1 Average Heat Release Rate (HRR avg). The average
heat release rate per unit area, over the time period starting at
time to ignition and ending 180 seconds later, as measured in
NFPA 271 or ASTM E 554 (units: kW/m²).

Rate of energy release for a given fire scenario expressed as
a function of time (units: W or Btu/s).

3.3.27 Incident Commander (IC). The individual responsible
for all incident activities, including the development of strate-
gies and tactics and the ordering and the release of resources.
[472, 2008]

3.3.28 Local Control. The point of control of the emergency
ventilation system or ventilation plant that is remote from the
operations control center.

3.3.29 Noncombustible Material. A material that, in the form
in which it is used and under the conditions anticipated, will not
ignite, burn, support combustion, or release flammable vapors,
when subjected to fire or heat. Materials that are reported as
passing ASTM E 130, Standard Test Method for Behavior of Materials
in a Vertical Tube Furnace at 750 Degrees C, shall be considered non-
combustible materials. [701, 2009]

3.3.30 Nonmechanical Emergency Ventilation System. A system
of smoke reservoirs, smoke vents, and/or dampers that are
designed to support the tenability criteria without the use of fans.

3.3.31 Occupancy.

3.3.31.1 Incidental Occupancies in Stations. The use of the
station by others who are neither transit system employees nor
passengers.

3.3.31.2 Nonsystem Occupancy Stations. An occupancy not
under the control of the system operating authority.

3.3.32 Operations Control Center. The operations center
where the authority controls and coordinates the systemwide
movement of passengers and trains from which communication
is maintained with supervisory and operating personnel of the
authority and with participating agencies when required.

3.3.33 Participating Agency. A public, quasipublic, or private
agency that has agreed to cooperate with and assist the author-
ity during an emergency.

3.3.34 Passenger Load.

3.3.34.1 Detraining Load. The number of passengers
alighting from a train at a platform.

3.3.34.2 Entraining Load. The number of passengers
boarding a train at a platform.

3.3.34.3 Link Load. The number of passengers traveling
between two stations on board a train or trains.
6.3.1.1.3 Walking Surfaces. Walking surfaces designated for evacuation of passengers shall be constructed of noncombustible materials.

6.3.1.1.4 Underwater Tubes. Underwater tubes shall be not less than Type II (000) noncombustible construction as defined in NFPA 220, as applicable.

6.3.1.1.5 Rail Ties.

6.3.1.1.5.1 Rail ties used in underground or enclosed locations, except as permitted in 6.3.1.1.5.2 or 6.3.1.1.5.3, shall be noncombustible materials, which comply with the requirements of ASTM E 136.

6.3.1.1.5.2 Rail ties used at switch or crossover locations shall comply with 6.3.1.1.5.1 or shall be fire-retardant treated wood in accordance with NFPA 703.

6.3.1.1.5.3 Rail ties and tie blocks in underground or enclosed track sections shall be permitted to be of wood encased in concrete such that only the top surface is exposed.

6.3.1.1.6 Structures. Remote vertical exit shafts and ventilation structures shall be not less than Type I (332) noncombustible construction as defined in NFPA 220.

6.3.1.1.7 Ancillary Areas.

6.3.1.1.7.1 Ancillary areas shall be separated from trainway areas within underground trainway sections by a minimum of 2-hour fire-resistive construction.

6.3.1.1.7.2 Ancillary areas shall be separated from trainway areas within underground trainway sections by a minimum of 2-hour fire-resistive construction.

6.3.1.2 Surface. Construction materials shall be not less than Type II (000) noncombustible material as defined in NFPA 220, as determined by an engineering analysis of potential fire exposure hazards to the structure.

6.3.1.3 Elevated. All structures necessary for trainway support and all structures and enclosures on or under trainways shall be of not less than Type I or Type II (000) or combinations of Type I or Type II noncombustible construction as defined in NFPA 220, as determined by an engineering analysis of potential fire exposure hazards to the structure.

6.3.2 Ventilation. Except as described in 6.3.2.1 and 6.3.2.2, emergency ventilation shall be provided in enclosed trainways in accordance with Chapter 7.

6.3.2.1* Emergency ventilation meeting the penetrability criteria for occupied spaces shall not be required in tall track areas where engineering analysis indicates that a fire on a train in the tall track area will not impact passengers or passenger areas.

6.3.2.2* Emergency ventilation meeting the penetrability criteria for occupied areas shall not be required in storage track areas where the storage track does not open along its length to passenger track areas and where an engineering analysis indicates that a fire on a train in the storage track area will not impact passengers or passenger areas.

6.3.3 Wiring Requirements. (See Section 5.4.)

6.3.3.1* General.

6.3.3.1.1 Traction power shall include the wayside pothead, the cable between the pothead and the contact (third) rail or overhead wire, the contact rail supports, and special warning and identification devices.

6.3.3.1.2 Life safety and fire protection criteria for the sub-system installed in the trainway shall conform to the requirements for underground trainways that are listed in 6.4.2.

6.3.3.1.3 All wiring materials and installations other than those for traction power shall conform to the requirements of NFPA 70.

6.3.3.2 Underground (Subways).

6.3.3.2.1 All wiring materials and installations within trainways, other than for traction power, shall conform to the requirements of NFPA 70 and, in addition, shall satisfy the requirements of 6.3.3.2.2 through 6.3.3.2.9.

6.3.3.2.2 Conduits, raceways, ducts, boxes, cabinets, and equipment enclosures shall be constructed of noncombustible materials in accordance with the requirements of ASTM E 136.

6.3.3.2.3 All conductors shall be insulated.

6.3.3.2.3.1 Ground wire installed in a metallic raceway shall be insulated.

6.3.3.2.3.2 Other ground wires shall be permitted to be bare.

6.3.3.2.4 All insulations shall conform to NFPA 70 and shall be moisture- and heat-resistant types carrying temperature ratings corresponding to either of the following conditions:

1. 75°C (167°F) for listed fire-resistant cables
2. 90°C (194°F) for all other applications

6.3.3.2.4.1 All insulated conductors and cables shall be listed for wet locations.

6.3.3.2.5 All wires and cables used, other than traction power cables, shall be listed as being resistant to the spread of fire and shall have reduced smoke emissions, by complying with 6.3.3.2.5.1 or 6.3.3.2.5.2.

6.3.3.2.5.1 All wires and cables shall comply with the FT4/IEEE 1202 exposure requirements for cable char height, total smoke released, and peak smoke release rate of ANSI/UL 1855-2007.

6.3.3.2.5.2 Wires and cables listed as having adequate fire-resistant and low-smoke-producing characteristics, by having a flame travel distance that does not exceed 1.5 m (5 ft) and generating a maximum peak optical density of smoke of 0.50 and a maximum average optical density of smoke of 0.15 when tested in accordance with NFPA 262, shall be permitted for use instead of the wires and cables specified in 6.3.3.2.5.1.

6.3.3.2.6* All conductors, except radio antennas, shall be enclosed in their entirety in armor sheaths, conduits, or enclosed raceways, boxes, and cabinets except in ancillary areas.

6.3.3.2.6.1* Conduits in conduits or raceways shall be permitted to be embedded in concrete or run in concrete electrical duct banks, but shall not be installed, exposed, or surface-mounted in air plenums unless cables are listed fire-resistant cables in accordance with 5.4.10.

6.3.3.2.7 Overcurrent elements that are designed to protect conductors serving emergency equipment motors (pumps, etc.), emergency lighting, and communications equipment and that are located in spaces other than the main electrical distribution system equipment rooms shall not depend on thermal properties for operation.

6.3.3.2.8 The emergency lighting and communications circuits shall be protected from physical damage by system vehicles or
Public Input No. 57-NFPA 130-2014 [Section No. 7.1.2.1]

7.1.2.1
For length determination, all contiguous enclosed trainway and underground system station segments between portals shall be included outside air openings the width of the trainway at the opening and a length parallel to the trainway equal to 15m(50ft).

Statement of Problem and Substantiation for Public Input

The term portal is not defined in NFPA 130 which then directs the user to Merriam-Webster's Collegiate Dictionary, 11th Edition for the ordinarily accepted meaning. The dictionary's definition, "Door, Entrance or the approach or entrance to a bridge or tunnel" does not convey the intent of the paragraph which is to prevent the passage of smoke and heat to an adjacent tunnel segment and to provide a point of safety for evacuating passengers.

Tunnel segments 200 feet and under could be separated by a few feet thus not requiring an engineering analysis or mechanical ventilation system. Smoke could travel throughout the tunnel segments and create an untenable environment throughout the egress route and still be in compliance with the current NFPA 130.

Requiring a 15m(50ft) opening between tunnel and station segments will insure that smoke will not create an untenable environment in a segment adjacent to the segment where the fire occurred. This is especially important where open cut trackways have been covered to create tunnel and station segments, and the openings or portals between segments do not contain an egress to the surface.

Submitter Information Verification

Submitter Full Name: Donald Iannuzzi
Organization: New York City Transit Authority
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Jul 01 11:07:38 EDT 2014
The emergency ventilation system shall be designed to do the following:

1. Provide a tenable environment along the path of egress from a fire incident in enclosed stations and enclosed trainways.
2. Produce sufficient airflow rates within enclosed trainways to meet critical velocity.
3. Be capable of reaching full operational mode within 180 seconds.
4. Accommodate the maximum number of trains that could be between ventilation shafts during an emergency.
5. Maintain the required fan inlet airflow rates for a minimum of 1 hour but not less than the required time of tenability.

Statement of Problem and Substantiation for Public Input

Provide clarity of an equipment exposure duration requirement, not tenability requirement.

Submitter Information Verification

Submitter Full Name: Silas Li
Organization: Parsons Brinckerhoff, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 12 14:14:22 EDT 2014
7.2.1.1 Where the airflow rates required to accomplish 7.2.1 (1), 7.2.1 (2), or approved alternative performance criteria are dependent upon the unimpaired function of the air distribution system, that system shall be designed to continue operation when exposed to the conditions generated during the design incident for the duration determined as per 7.2.1 (5). Although rating may not necessarily be required, materials or systems that are fire rated for the required duration shall be permitted to be used.

7.2.1.2 Where the airflow rates required to accomplish 7.2.1(1), 7.2.1(2), or approved alternative performance criteria are dependent upon the continued integrity of structural and architectural features, those features shall be designed to remain intact when exposed to the conditions generated during the design incident for the duration determined as per 7.2.1(5). Although rating may not necessarily be required, materials or systems that are fire rated for the required duration shall be permitted to be used.

Statement of Problem and Substantiation for Public Input

For distribution systems, fire rated elements or systems may sometimes be required. In many design cases, the ventilation systems rely at least to some extent upon structural or architectural features forming part of the smoke management system geometry. It is necessary that these elements remain sufficiently intact for the intended design incident, exposure and duration, which may also require rated systems.

Submitter Information Verification

Submitter Full Name: DAVID PLOTKIN  
Organization: AECOM  
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Thu Jul 03 11:40:23 EDT 2014
7.2.3
The design shall encompass the following:

1. The fire heat release rate and fire smoke release rate produced by the combustible load of a vehicle and any combustible materials that could contribute to the fire load at the incident site
2. The fire growth rate
3. *Fire scenarios and fire profiles
4. Station and trainway geometries
5. The effects of elevation, elevation differences, ambient temperature differences, and ambient wind
6. A system of fans, shafts, and devices for directing airflow in stations and trainways
7. A program of predetermined emergency response procedures capable of initiating prompt response from the operations control center in the event of a fire emergency
8. A ventilation system reliability analysis that, as a minimum, considers the following subsystems:
   9. **Electrical**
   10. **Mechanical**
   11. **Supervisory control**

Statement of Problem and Substantiation for Public Input

This is part of a Public Input providing minimum requirements concerning the selection of design fires. New definitions are added in Section 3 and a new Annex H is added.

Related Public Inputs for This Document

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Submitter Information Verification

Submitter Full Name: Silas Li
Organization: Parsons Brinckerhoff, Inc.
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Jul 03 14:48:21 EDT 2014
7.2.3

The design shall encompass the following:

1. The fire heat release rate and fire smoke release rate produced by the combustible load of a vehicle and any combustible materials that could contribute to the fire load at the incident site
2. The fire growth rate
3. Station and trainway geometries
4. The effects of elevation, elevation differences, ambient temperature differences, and ambient wind
5. A system of fans, shafts, and devices for directing airflow in stations and trainways
6. One critical fan out of service or operational measures to ensure that life safety is not compromised with one critical fan out of service
7. A program of predetermined emergency response procedures capable of initiating prompt response from the operations control center in the event of a fire emergency
8. A ventilation system reliability analysis that, as a minimum, considers the following subsystems:
   a. Electrical
   b. Mechanical
   c. Supervisory control

Statement of Problem and Substantiation for Public Input

NFPA 502 edition 2014 has the same requirement. The proposed change follows the industrial trend of requiring one fan out of service for the design of emergency ventilation systems.

Submitter Information Verification

Submitter Full Name: Silas Li
Organization: Parsons Brinckerhoff, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Sun Jul 06 14:34:22 EDT 2014
7.2.5

The design and operation of the signaling system, traction power blocks, and ventilation system shall be coordinated among each other and with the Train Operations Plans and Emergency Response Plans to match the total number of trains that could be between ventilation shafts during an emergency.

Additional Proposed Changes

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<td>Change related to 7.2.5 and A.7.2.5</td>
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Statement of Problem and Substantiation for Public Input

Proposed change adds two operation plan items for consideration in the necessary coordination. The viability of the intended operation plan and emergency response are critical when more than one train is designed to be in a ventilation zone. Such viability can only be achieved when the design and operations planning are integral in the determination of project criteria.

Related Public Inputs for This Document

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Submitter Information Verification

Submitter Full Name: DAVID PLOTKIN
Organization: AECOM
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Jul 03 12:40:25 EDT 2014
7.2.5* The design and operation of the signaling system, traction power blocks, and ventilation system shall be coordinated among each other and with the Train Operations Plans and Emergency Response Plans to match the total number of trains that could be between ventilation shafts during an emergency.

A.7.2.5 Transition from fixed-block to moving-block (cab-based or communication-based) signaling is being made by many properties to increase train throughputs during rush hour operation. Ventilation zones are fixed elements, and the number of trains allowed in a single zone affects both ventilation plant requirements and the effectiveness of the ventilation response. Traction power blocks are fixed elements and affect the ability to extract non-incident trains from the incident ventilation zone. Signal system track circuits are fixed elements and affect the ability to determine the location of incident and non-incident trains in the incident ventilation zone. Signal system reversing capability and rapidness of executing a reversal in an emergency are key to the effective extraction of non-incident trains. Due to the potential for a valid incident ventilation response to move smoke past (and engulf) a non-incident train, the best protection to passengers is to allow no more than one train in a ventilation zone. Failing that, there should be a viable extraction capability to remove non-incident trains in the same time frame as the activation of the ventilation response. This extraction requires coordination of the three system elements in terms of design, and with the train operation plans and emergency response plans with respect to how the trains will be operated and how the designed systems will be used during emergency operation. Non-incident trains should be capable of being located and removed from the incident area before the de-energization of the traction power prevents train movement for an extended period or the operation of the ventilation system in response to the fire incident involves the trains in the incident. Examples of the provisions necessary to accomplish this capability are the inclusion of traction power segmentation zones within ventilation zones and the inclusion of sufficiently short track signal circuit lengths to ensure all trains are accurately located.

**Substantiation:**

Proposed change adds two operation plan items for consideration in the necessary coordination. The viability of the intended operation plan and emergency response are critical when more than one train is designed to be in a ventilation zone. Such viability can only be achieved when the design and operations planning are integral in the determination of project criteria.
7.2.6 *.
The tenability and time-of-tenability criteria for stations and trainways shall be established and approved. For stations, the time shall be greater than the calculated egress time used to establish egress capacity in 5.3.2.1.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

For 7.2.6, the Standard’s current mandatory text lacks a requirement to establish project tenability and time-of-tenability criteria for approval.

For A.7.2.6, the Standard’s current advisory text is focused on time-of-tenability, and both overall tenability and the breadth of other tenability considerations addressed in Annex B should be mentioned in the Annex A referral to Annex B. The proposed modifications will strengthen connection between Annex B.2 and mandatory text, to assure that tenability criteria are established to address acoustic concerns not addressed in the current Standard.

For B.2.1.5, the Standard’s current advisory text contains undocumented maximum noise exposure limits and insufficient guidance for communication with and protection of occupants during the emergency evacuation scenario.

The proposed changes add guidance and related values for consideration in fixing project criteria that are found in other established Standards and adapted for the specific environment of this Standard, clarified with noise metrics and measurement parameters, and supported with relevant definitions added in Chapter 3 and references added in Annex H.

Related Public Inputs for This Document

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Submitter Information Verification

Submitter Full Name: DAVID PLOTKIN
Organization: AECOM
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Jul 03 12:14:10 EDT 2014
3.3.xx **Decibel.** The logarithmic units associated with sound pressure level.

3.3.xx **Un-weighted Decibel (dBZ).** Decibel values without weighting applied.

3.3.xx **A-weighted Decibel (dBA).** Decibel values with weighting applied over the frequency range of 20Hz to 20kHz to reflect human hearing.

3.3.xx **Sound Pressure Level.** The logarithmic ratio of the root-mean squared sound pressure to the reference sound pressure ($2.0 \times 10^{-5}$ Pascals).

3.3.xx **Common Intelligibility Scale (CIS).** See NFPA 72-2013 Annex D.2.4.5.

3.3.xx **Speech Interference Level (SIL).** A calculated quantity providing a guide to the interfering effect of noise on speech intelligibility. One-fourth of the sum of the band sound pressure levels for octave-bands with normal mid-band frequencies of 500, 1000, 2000, and 4000 Hz. Unit, decibel; abbreviation, SIL.

3.3.xx **Speech Transmission Index (STI).** See NFPA 72-2013 Annex D.2.1.1.

3.3.xx **Voice Communication System.** An amplified paging system for speech communication, including emergency notifications and announcements.

3.3.xx **Time Weighted Average (TWA).** The Time Weighted Average sound level is a continuous sound level which, over a defined period, would produce the same noise dose as the varying sound level.

3.3.xx **L\textsubscript{eq}.** Level equivalent, the average sound level over time on an acoustical energy basis

3.3.xx **‘Slow’.** The response time of a sound level meter’s RMS detector corresponding to a rise time constant of 1 second per ANSI S1.4 and IEC 61672.

7.2.6* The tenability and time-of-tenability criteria for stations and trainways shall be established and approved. For stations, the time shall be greater than the calculated egress time used to establish egress capacity in 5.3.2.1.

A.7.2.6 Tenability criteria should consider a number of environmental conditions. The time of tenability should consider the possibility of one or more egress paths being blocked by fire or smoke (as may be demonstrated by analysis) and for other considerations that are not accounted for in the egress capacity calculations. (See B.2.3 for additional information to be considered.)

B.2.1.5 Noise Levels. Criteria for noise levels should be established for the various situations and potential exposures particular to the environments addressed by this Standard. a maximum of 115 dBA for a few seconds and a maximum of 92 dBA for the remainder of the exposure. The intent of the recommended criteria is to maintain at least a minimal level of speech intelligibility along emergency evacuation routes. This may require additional noise control measures and acoustical treatment to achieve. Exceptions taken to the recommended noise levels for reasons of cost and feasibility should be as few and as slight as reasonably possible. For example, local area exceptions to the recommended acoustic criteria may be required to be applied for defined limited distances along the evacuation path that are near active noise sources. Other means of providing emergency evacuation guidance using acoustic, non-acoustic or combined methods may be considered.

(a) Noise levels should not exceed the following:

The sound pressure level from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface, should not exceed 94 dBA $L_{eq}$ ‘slow’ for a period of 1-hour, and should at no time exceed 140

The sound pressure level from all active systems measured where staff would be present for maintenance and testing and where hearing protection is not available should not exceed 85 dBA TWA ‘slow’ for a period of 8-hours, and should at no time exceed 140 dBZ Peak. [ref: 29 CFR 1910.95 (OSHA)]

(b) Where reliance upon unamplified speech is used as part of the emergency response:

The sound interference level (SIL) from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface should not exceed 78 dBZ L_eq ‘slow’ over any period of 1 minute, using the arithmetic average of un-weighted sound pressure level in the 500, 1000, 2000 and 4000 Hz octave bands.

(c) For intelligible communication between emergency evacuation responders and the public where reliance upon amplified speech is used as part of the emergency response within a station:

The sound pressure level from all active systems measured inside a station along the path of evacuation during the emergency response at any point five (5) feet above the walking surface where a voice communication system is intended to be used should not exceed the higher of 70 dBA L_eq ‘slow’ measured over any 1 minute period or 10 dB below the measured voice communication system sound pressure level in the octave bands greater than 63 Hz with a steady-state red noise input signal set to the maximum A-weighted setting of the voice communication system (if the voice communication system has an ambient sensing microphone).

The speech intelligibility of voice communication systems under the same conditions and for the same spaces, should achieve a measured STI of not less than 0.45 (0.65 CIS), and an average STI of not less than 0.5 (0.7 CIS) as per NFPA 72-2013 Annex D.2.4.1. Refer to NFPA 72-2013 Annex D for further information on Speech Intelligibility for voice communication systems.

The STI criterion is more stringent than the noise level limit and may require additional noise control measures and acoustical treatment to achieve.

d) Where reliance upon amplified speech is used as part of the emergency response within a tunnel:

Where a voice communication system is intended to be used within a tunnel, the sound pressure level from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface should not exceed 75 dBA L_eq ‘slow’ measured over any period of 1 minute.

The speech intelligibility of fixed voice communication systems under the same conditions and for the same spaces, should achieve a measured STI of not less than 0.45 (0.65 CIS), and an average STI of not less than 0.5 (0.7 CIS) as per NFPA 72-2013 Annex D.2.4.1. Refer to NFPA 72-2013 Annex D for further information on Speech Intelligibility for voice communication systems.

The STI criterion is more stringent than the noise level limit and may require additional noise control measures and acoustical treatment to achieve.

H.1.2.8 ISO Publications [and renumber]

H.1.2.9 OSHA Publications [and renumber]


H.1.2.11 Other Publications


Substantiation

For 7.2.6, the Standard’s current mandatory text lacks a requirement to establish project tenability and time-of-tenability criteria for approval.

For A.7.2.6, the Standard’s current advisory text is focused on time-of-tenability, and both overall tenability and the breadth of other tenability considerations addressed in Annex B should be mentioned in the Annex A referral to Annex B. The proposed modifications will strengthen connection between Annex B.2 and mandatory text, to assure that tenability criteria are established to address acoustic concerns not addressed in the current Standard.

For B.2.1.5, the Standard’s current advisory text contains undocumented maximum noise exposure limits and insufficient guidance for communication with and protection of occupants during the emergency evacuation scenario.

The proposed changes add guidance and related values for consideration in fixing project criteria that are found in other established Standards and adapted for the specific environment of this Standard, clarified with noise metrics and measurement parameters, and supported with relevant definitions added in Chapter 3 and references added in Annex H.
Emergency ventilation fans, their motors, and all related components exposed to the exhaust airflow shall be designed to operate at the fan inlet airflow hot temperature condition from the design fire for a minimum of 1 hour.

Statement of Problem and Substantiation for Public Input

This is the correction of a wrong word. "design fan" should read "design fire". The Report on Proposals (ROP) for the proposed changes to section 7.3.2. shows design fire.

Submitter Information Verification

Submitter Full Name: Silas Li
Organization: Parsons Brinckerhoff, Inc.
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Thu Jun 12 13:57:27 EDT 2014
7.6.2
If the configuration required by 7.5.6.1 is not possible, surface openings shall be protected by other means to prevent smoke from re-entering the system.

Statement of Problem and Substantiation for Public Input

I believe that 7.5.1 should be 7.6.1 in section 7.6.2. It could be a simple typing or printing error.

Submitter Information Verification

Submitter Full Name: Qihui Zhang
Organization: GEODATA
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 14 05:52:43 EST 2014
On-board energized electrical equipment not subject to regulation in other sections of this standard shall be subject to a fire safety analysis. When such equipment is listed and/or labeled by a certified listing agency, conditions of that listing shall be reviewed in conducting the fire safety analysis to determine the degree to which further analyses of the fire performance of such equipment will be conducted and approved by the AHJ.

Methods used to isolate potential ignition sources from combustible materials shall be demonstrated to the AHJ to be suitable through testing and/or analysis.

Add an Appendix section as follows:

The use of electrical appliances has increased dramatically in the past decade. Devices such as point of sale equipment, cooking equipment, wi-fi and PC charging related equipments, on board information displays and train control components which are not specifically reviewed for applications in rail vehicles has proliferated. Because of the unique operating environmental factors posed by a rail road environment such as vibration, temperature fluctuations and maintenance frequency it is important to assess the ignition and fire spread potential posed by such items not specifically manufactured or modified for use in rail passenger vehicles.

Additional Proposed Changes

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description Approved</th>
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<tbody>
<tr>
<td>130_Zicherman_Proposed_Change_to_8.3.3_and_A.8.3.3.pdf</td>
<td>PI Form</td>
</tr>
</tbody>
</table>

Statement of Problem and Substantiation for Public Input

Proposed appendix text includes the appropriate substantiation for this change: "The use of electrical appliances has increased dramatically in the past decade. Devices such as point of sale equipment, cooking equipment, wi-fi and PC charging related equipments, on board information displays and train control components which are not specifically reviewed for applications in rail vehicles has proliferated. Because of the unique operating environmental factors posed by a rail road environment such as vibration, temperature fluctuations and maintenance frequency it is important to assess the ignition and fire spread potential posed by such items not specifically manufactured or modified for use in rail passenger vehicles."

This is a significant potential problem as for example when cooking equipment (refrigeration or coffee makers) that is labeled as by NSF or UL for commercial use contains thermoplastic polymer based insulations. These will melt and spread fire as when exposed to an external small ignition source nearby which if the same equipment were used in a sprinklered restaurant would pose no threat. Likewise, computer equipment with combustible housings that may be suitable for schools or homes may not be suitable for rail use and these items are not now subject to review for fire performance most frequently.

Submitter Information Verification

Submitter Full Name: Joseph Zicherman
Organization: Fire Cause Analysis
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Mon Jul 07 15:38:28 EDT 2014
8.4.1 *
The test procedures and minimum performance for materials and assemblies shall be as detailed in Table 8.4.1.

### Table 8.4.1 Fire Test Procedures and Performance Criteria for Materials and Assemblies

<table>
<thead>
<tr>
<th>Category</th>
<th>Function of Material</th>
<th>Test Method</th>
<th>Performance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cushioning</td>
<td>All individual flexible cushioning materials used in seat cushions, mattresses, mattress pads, armrests, crash pads, and grab rail padding a–e</td>
<td>ASTM D 3675, ASTM E 662</td>
<td>( I_s \leq 25 ) ( D_s \cdot (1.5) \leq 100 ) ( D_s \cdot (4.0) \leq 175 )</td>
</tr>
<tr>
<td>Fabrics</td>
<td>Seat upholstery, mattress ticking and covers, curtains, draperies, window shades, and woven seat cushion suspensions a–c, f–h</td>
<td>14 CFR 25, Appendix F, Part I (vertical test)</td>
<td>Flame time ( \leq 10 ) sec, Burn length ( \leq 6 ) in. ( D_s \cdot (4.0) \leq 200 )</td>
</tr>
<tr>
<td>Other vehicle components</td>
<td>Seat and mattress frames, wall and ceiling lining and panels, seat and toilet shrouds, toilet seats, trays and other tables, partitions, shelves, opaque windscreens, combustible signage, end caps, roof housings, articulation bellows, exterior shells, nonmetallic skirts, battery case material, and component boxes and covers a,b,i–k</td>
<td>ASTM E 162, ASTM E 662</td>
<td>( I_s \leq 35 ) ( D_s \cdot (1.5) \leq 100 ) ( D_s \cdot (4.0) \leq 200 )</td>
</tr>
<tr>
<td></td>
<td>Thermal and acoustical insulation a,b</td>
<td>ASTM E 162, ASTM E 662</td>
<td>( I_s \leq 25 ) ( D_s \cdot (4.0) \leq 100 )</td>
</tr>
<tr>
<td></td>
<td>HVAC ducting a,b</td>
<td>ASTM E 162, ASTM E 662</td>
<td>( I_s \leq 25 ) ( D_s \cdot (4.0) \leq 100 )</td>
</tr>
<tr>
<td></td>
<td>Floor covering b,k,l</td>
<td>ASTM E 162, ASTM E 662</td>
<td>CRF ( \geq 5 ) ( \text{kW/m}^2 ) ( D_s \cdot (1.5) \leq 100 ) ( D_s \cdot (4.0) \leq 200 )</td>
</tr>
<tr>
<td></td>
<td>Light diffusers, windows, and transparent plastic windscreens b,i</td>
<td>ASTM E 162, ASTM E 662</td>
<td>( I_s \leq 100 ) ( D_s \cdot (1.5) \leq 100 ) ( D_s \cdot (4.0) \leq 200 )</td>
</tr>
<tr>
<td></td>
<td>Adhesives and sealants</td>
<td>ASTM E 162, ASTM E 662</td>
<td>( I_s \leq 35 ) ( D_s \cdot (1.5) \leq ) and ( D_s \cdot (4.0) \leq 200 )</td>
</tr>
<tr>
<td></td>
<td>Elastomers a,b,i,j</td>
<td>ASTM C 1166, ASTM E 662</td>
<td>Flame propagation ( \leq 100 ) mm (4 in.) ( D_s \cdot (1.5) \leq 100 ) ( D_s \cdot (4.0) \leq 200 )</td>
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<td>Wire and cable</td>
<td>All</td>
<td>See 8.6.7.1.1.1 through 8.6.7.1.3</td>
<td>See 8.6.7.1.1 through 8.6.7.1.3</td>
</tr>
</tbody>
</table>
8.4.1.1 *

Materials tested for surface flammability shall not exhibit any flaming running or flaming dripping.

8.4.1.2

The ASTM E 662 maximum test limits for smoke emission (specific optical density) shall be based on both the flaming and the nonflaming modes.

8.4.1.3 *

Testing of a complete seat assembly (including cushions, fabric layers, and upholstery) according to ASTM E 1537 using the pass/fail criteria of California Technical Bulletin 133 and testing of a complete mattress assembly (including foam and ticking) according to ASTM E 1590 using the pass/fail criteria of California Technical Bulletin 129 shall be permitted in lieu of the test methods prescribed herein, provided the assembly component units remain unchanged or new (replacement) assembly components possess fire performance properties equivalent to those of the original components tested.

8.4.1.3.1

A fire hazard analysis shall also be conducted that considers the operating environment within which the seat or mattress assembly will be used in relation to the risk of vandalism, puncture, cutting, introduction of additional combustibles, or other acts that potentially expose the individual components of the assemblies to an ignition source.

8.4.1.3.2

The requirements of 8.4.1.5 through 8.4.1.8 shall be met.

8.4.1.4

Testing shall be performed without upholstery.
8.4.1.5
The surface flammability and smoke emission characteristics shall be demonstrated to be permanent after
dynamic testing according to ASTM D 3574, Test I2 or Test I3, both using Procedure B, except that the test
samples shall be a minimum of 150 mm (6 in.) × 450 mm (18 in.) × the thickness used in end-use
configuration, or multiples thereof. If Test I3 is used, the size of the indentor described in Section 96.2 of
ASTM D 3574 shall be modified to accommodate the specified test specimen.

8.4.1.6
The surface flammability and smoke emission characteristics shall be demonstrated to be permanent by
washing, if appropriate, in accordance with the manufacturer's recommended procedure. If a washing
procedure is not provided by the manufacturer, the fabric shall be washed in accordance with ASTM E

8.4.1.7
The surface flammability and smoke emission characteristics shall be demonstrated to be permanent by dry
cleaning, if appropriate, according to ASTM D 2724.

8.4.1.8
Materials that cannot be washed or dry-cleaned shall be so labeled and shall meet the applicable
performance criteria after being cleaned as recommended by the manufacturer.

8.4.1.9
Combustible operational and safety signage shall not be required to meet flame spread or smoke emission
requirements if the combustible mass of a single sign does not exceed 500 g (1.1 lb) and the aggregate
area of combustible signage does not exceed 1 ft² per foot of car length.

8.4.1.10 *

Materials used to fabricate miscellaneous, discontinuous small parts (such as knobs, rollers, fasteners,
clips, grommets, and small electrical parts) that will not contribute materially to fire growth in end use
configuration shall be exempt from flammability and smoke emission performance requirements, provided
that the surface area of any individual small part is less than 100 cm² (16 in.²) in end use configuration and
an appropriate fire hazard analysis is conducted that addresses the location and quantity of the materials
used and the vulnerability of the materials to ignition and contribution to flame spread.

8.4.1.11
Carpeting used as a wall or ceiling covering shall be tested according to ASTM E 162 and ASTM E 662 and
shall meet the respective criteria of $I_S \leq 35$, $D_s(1.5) \leq 100$, and $D_s(4.0) \leq 200$. (See 8.4.1.1 and 8.4.1.2.)

8.4.1.12
If padding is used in the actual installation, floor covering shall be tested with padding in accordance with
NFPA 253 or ASTM E 648.

8.4.1.13
Penetrations (ducts, etc.) shall be designed against acting as passageways for fire and smoke, and
representative penetrations of each type shall be included as part of test assemblies.

8.4.1.14 *

See Section 8.5.

8.4.1.15 *

Portions of the vehicle body that separate the major ignition source, energy sources, or sources of fuel load
from vehicle interiors shall have fire resistance as determined by a fire hazard analysis acceptable to the
authority having jurisdiction that addresses the location and quantity of the materials used, as well as
vulnerability of the materials to ignition, flame spread, and smoke generation. These portions shall include
equipment-carrying portions of a vehicle's roof and the interior structure separating the levels of a bi-level
car but do not include a flooring assembly subject to Section 8.5. In those cases, the use of the NFPA 251
(ASTM E 119) test procedure shall not be required.

Statement of Problem and Substantiation for Public Input

Currently the performance criteria for battery case material is contained in Chapter 8.6.9 (7). The performance
criteria should be included in the Table in 8.4.1 to make it consistent with the location of all the materials
performance criteria. Therefore "batter case material" was added to the "Other Vehicle Components" category.
The performance criteria will be deleted from Chapter 8.6.9 (7) in a subsequent proposal.

Submitter Information Verification
<table>
<thead>
<tr>
<th><strong>Submitter Full Name:</strong></th>
<th>Steven Roman</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organization:</strong></td>
<td>LTK Engineering Services</td>
</tr>
<tr>
<td><strong>Street Address:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>City:</strong></td>
<td></td>
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<tr>
<td><strong>State:</strong></td>
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<tr>
<td><strong>Zip:</strong></td>
<td></td>
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<tr>
<td><strong>Submittal Date:</strong></td>
<td>Wed Jun 04 13:26:19 EDT 2014</td>
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</tbody>
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The test procedures and minimum performance for materials and assemblies shall be as detailed in Table 8.4.1.

<table>
<thead>
<tr>
<th>Category</th>
<th>Function of Material</th>
<th>Test Method</th>
<th>Performance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cushioning</td>
<td>All individual flexible cushioning materials used in seat cushions, mattresses,</td>
<td>ASTM D 3675</td>
<td>( I_s \leq 25 )</td>
</tr>
<tr>
<td></td>
<td>mattress pads, armrests, crash pads, and grab rail padding, a–e</td>
<td>ASTM E 662</td>
<td>( D_s \cdot (1.5) \leq 100 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>( D_s \cdot (4.0) \leq 175 )</td>
</tr>
<tr>
<td>Fabrics</td>
<td>Seat upholstery, mattress ticking and covers, curtains, draperies, window shades,</td>
<td>14 CFR 25, Appendix F,</td>
<td>Flame time ( \leq )</td>
</tr>
<tr>
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<td>and woven seat cushion suspensions a–c, f–h</td>
<td>Part I (vertical test)</td>
<td>10 sec</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Burn length ( \leq )</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>6 in.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ASTM E 662</td>
<td>( D_s \cdot (4.0) \leq 200 )</td>
</tr>
<tr>
<td>Other vehicle</td>
<td>Seat and mattress frames, wall and ceiling lining and panels, seat and toilet shrouds,</td>
<td>ASTM E 162</td>
<td>( I_s \leq 35 )</td>
</tr>
<tr>
<td>components</td>
<td>toilet seats, trays and other tables, partitions, shelves, opaque windscreens,</td>
<td></td>
<td>( D_s \cdot (1.5) \leq 100 )</td>
</tr>
<tr>
<td></td>
<td>combustible signage, end caps, roof housings, articulation bellows, exterior shells,</td>
<td>ASTM E 662</td>
<td>( D_s \cdot (4.0) \leq 200 )</td>
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<tr>
<td></td>
<td>nonmetallic skirts, and component boxes and covers a,b,i–k</td>
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<tr>
<td></td>
<td>Thermal and acoustical insulation a,b</td>
<td>ASTM E 162</td>
<td>( I_s \leq 25 )</td>
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<td></td>
<td></td>
<td>ASTM E 662</td>
<td>( D_s \cdot (4.0) \leq 100 )</td>
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<tr>
<td></td>
<td>HVAC ducting a,b</td>
<td>ASTM E 162</td>
<td>( I_s \leq 25 )</td>
</tr>
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<td></td>
<td></td>
<td>ASTM E 662</td>
<td>( D_s \cdot (4.0) \leq 100 )</td>
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<tr>
<td></td>
<td>Floor covering b,k,l</td>
<td>ASTM E 648</td>
<td>CRF ( \geq 5 ) kW/m (^2)</td>
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<td></td>
<td>ASTM E 662</td>
<td>( D_s \cdot (1.5) \leq 100 )</td>
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<td></td>
<td></td>
<td></td>
<td>( D_s \cdot (4.0) \leq 200 )</td>
</tr>
<tr>
<td></td>
<td>Light diffusers, windows, and transparent plastic windscreens b,i</td>
<td>ASTM E 162</td>
<td>( I_s \leq 100 )</td>
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<tr>
<td></td>
<td></td>
<td>ASTM E 662</td>
<td>( D_s \cdot (1.5) \leq 100 )</td>
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<tr>
<td></td>
<td>Adhesives and sealants</td>
<td>ASTM E 162</td>
<td>( I_s \leq 35 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ASTM E 662</td>
<td>( D_s \cdot (1.5) \leq )</td>
</tr>
</tbody>
</table>

\[ 100 \quad D_s \cdot (4.0) \]
Statement of Problem and Substantiation for Public Input

In the 2014 draft copy of NFPA 130 Chapter 8 (ref. ROP 130-177) the smoke emission requirements for the adhesives and sealants was correct. However in the final printing of the 2014 version, the change was executed incorrectly, eliminating the performance criteria for Optical Density at 1.5 minutes. This proposed change corrects that error.

Submitter Information Verification

Submitter Full Name: Steven Roman
Organization: LTK Engineering Services
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 04 11:47:15 EDT 2014
8.5.1.1..3
The roof assembly shall be tested with a representative loading consistent with the vehicle design if the roof is tested in an upright orientation.

Statement of Problem and Substantiation for Public Input

ASTM E119 no longer stipulates the type of furnace to be used for testing. Historically the roofs have been tested inverted on the traditional furnace. When tested inverted their is no room in the furnace to add suspended equipment loads as they would interfere with the location of the thermocouples which are essential in regulating the time/temperature curve dictated by ASTM E119. Recent roof tests that have been tested in the upright position do include the equipment load on the roof as the burners are located between the equipment boxes and the roof skin. Unfortunately not all the traditional test laboratories are set up to conduct the roof test in the upright position.

Submitter Information Verification

Submitter Full Name: Steven Roman
Organization: LTK Engineering Services
Street Address: 
City: 
State: 
Zip: 
8.5.1.2.4
The size of the exposed portion of the roof assembly shall be at least 3.7m (12 ft) long by the normal with of the vehicle at the roof rail.

Statement of Problem and Substantiation for Public Input

The size of the roof assembly sample was never defined as it is for the floor sample. To provide a clear direction, the size of the roof sample is now defined.

Submitter Information Verification

Submitter Full Name: Steven Roman
Organization: LTK Engineering Services
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 04 14:07:06 EDT 2014
Statement of Problem and Substantiation for Public Input

Without a specified exposure time for testing roof assemblies, the current interpretation of NFPA 130 leads the exposure time for roof assemblies to be 30 minutes. The traditional method of testing the roof assemblies is inverted on the ASTM E119 furnace. This type of exposure (directly down the roof) with the heat of the E119 furnace will not be seen in a roof fire. If equipment on a roof is burning, the flames travel away from the roof of a railcar not directly on the roof sheet. Testing of a roof assembly inverted is extremely severe and the carbuilder must include non-traditional insulation materials (rock wool, ceramic fiber insulation) and possibly added insulation on the ceiling panels in order to meet the temperature rise requirements of this Standard. This causes not only an increase in weight of the vehicle but also an increase in cost. Testing on an ASTM E119 furnace for a time of 15 minutes is more than adequate for a roof assembly.

Submitter Information Verification

Submitter Full Name: Steven Roman
Organization: LTK Engineering Services
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Jun 05 07:32:32 EDT 2014
Public Input No. 26-NFPA 130-2014 [ Section No. 8.5.1.3.2 ]

8.5.1.3.2
The minimum fire exposure duration shall be the greater of the following:

(1)* Twice the maximum expected time period under normal circumstances for a vehicle to stop completely and safely from its maximum operating speed, plus the time necessary to evacuate a full load of passengers from the vehicle under approved conditions

(2)* 15 minutes for automated guideway transit (AGT) vehicles, and low floor vehicles, 30 minutes for all other passenger-carrying vehicles

Statement of Problem and Substantiation for Public Input

A recent popular class of rail vehicles are streetcars which operate solely on the streets in mixed traffic. They do not operate in tunnels or on overhead guideways. The typical streetcar is a low floor design which forces all equipment to the roof of the vehicle. Therefore there is very little combustible material beneath the floor. The typical streetcar also has three doorways per side (some longer vehicles may have more) which provide many avenues of escape in case of an emergency evacuation, requiring only one step down to the street level. Currently there is a large emphasis placed on weight reduction in modern rail vehicles due to the sensitivity in this industry to reduced energy consumption. Requiring a 30 minute floor design does increase the weight of the vehicle. With three doors per side evacuation times will be very low considering that passengers will not have to use a ladder to evacuate to the road bed as they would on a rapid transit, commuter, intercity and some light rail lines. In order to facilitate a light weight design reducing the floor fire test time to 15 minutes for streetcars is appropriate.

Submitter Information Verification

Submitter Full Name: Steven Roman
Organization: LTK Engineering Services
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 04 14:13:10 EDT 2014
8.5.1.3.3
During the entire fire exposure, the following parameters shall apply:

1. Transmission of heat through the assembly shall not be sufficient to raise the temperature on its unexposed surface more than 139°C - 121°C (250°F) average and 181°C - 163°C (325°F) single point.

2. The assembly shall not permit the passage of flame or gases hot enough to ignite cotton waste on the unexposed surface of the assembly.

3. The assembly shall support the representative loading.

Statement of Problem and Substantiation for Public Input

The conversions from Fahrenheit to Celcius were incorrect. This revision corrects that error.

Submitter Information Verification

Submitter Full Name: Steven Roman
Organization: LTK Engineering Services
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 04 13:45:34 EDT 2014
8.6.9 Battery Installation.
Batteries and their associated circuitry shall be installed with the following requirements:

(1) Battery charging systems shall be designed to prevent overcharging of the battery.

(2) The battery shall be designed with an emergency cutoff system.

(3) The battery installation area shall be provided with a heat, smoke, or other fire detection system as appropriate for the environment in which it will operate.

(4) The battery installation area shall be separated from the car interior by the use of materials that are noncombustible, in accordance with the requirements of ASTM E 136.

(5) The battery installation area shall not use materials with hygroscopic properties.

(6) The battery installation area shall be provided with sufficient diffusion and ventilation of the gases from the battery to prevent the accumulation of an explosive mixture.

(7) Battery casing material shall comply with a radiant panel index that does not exceed 35 when tested in accordance with ASTM E 162, with specific optical density of smoke at 4 minutes into the test that does not exceed 200, and with specific optical density at 1.5 minutes that does not exceed 100 when tested in accordance with ASTM E 662 at the thickness of the casing material used in the battery. Table 8.4.1.

Statement of Problem and Substantiation for Public Input

The performance criteria for materials is outlined in Table 8.4.1. Deleting the performance criteria from this section and moving it to Table 8.4.1 makes it consistent with the location of all the other material performance criteria.

Submitter Information Verification

Submitter Full Name: Steven Roman
Organization: LTK Engineering Services
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 04 13:33:20 EDT 2014
8.9.4 Lightning Protection.

8.9.4.1 Each vehicle that is supplied power from the overhead electrical contact wire shall be provided with a suitable and effective lightning arrester for the protection of all electrical circuits.

8.9.4.2 Lightning arresters on vehicles shall have a grounding connection of not less than 6 AWG or cross-section of 13.3 mm² and be run in as straight a line as possible to the ground.

8.9.4.2.1 Lightning arresters shall be properly protected against mechanical injury.

8.9.4.2.2 The grounding conductor shall not be run in metal conduit unless such conduit is bonded to the grounding conductor at both ends.

Statement of Problem and Substantiation for Public Input

Add annex material referencing NFPA 780 to determine the need by using the risk assessment.

Related Public Inputs for This Document

<table>
<thead>
<tr>
<th>Related Input</th>
<th>Relationship</th>
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<tbody>
<tr>
<td>Public Input No. 97-NFPA 130-2014 [Section No. 8.9.4]</td>
<td>Reference to annex material</td>
</tr>
</tbody>
</table>

Submitter Information Verification

Submitter Full Name: Mark Morgan
Organization: East Coast Lightning Equipment
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 15:28:44 EDT 2014
# Public Input No. 97-NFPA 130-2014 [Section No. 8.9.4]

8.9.4 Lightning Protection.  
8.9.4.1 Each vehicle that is supplied power from the overhead electrical contact wire shall be provided with a suitable and effective lightning 
\textit{arrester} surge protection devices (SPD), for the protection of all electrical circuits.  
8.9.4.2 Lightning \textit{arresters} surge protection devices (SPD) on vehicles shall have a grounding connection of not less than 6 AWG or cross-section of 13.3 mm$^2$ and be run in as straight a line as possible to the ground.  
8.9.4.2.1 Lightning \textit{arresters} surge protection devices (SPD) shall be properly protected against mechanical injury.  
8.9.4.2.2 The grounding conductor shall not be run in metal conduit unless such conduit is bonded to the grounding conductor at both ends.

## Statement of Problem and Substantiation for Public Input

Change lightning arresters to surge protection devices (SPD) to clarify accepted term.

## Related Public Inputs for This Document

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## Submitter Information Verification

<table>
<thead>
<tr>
<th>Submitter Full Name:</th>
<th>Mark Morgan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization:</td>
<td>East Coast Lightning Equipment</td>
</tr>
<tr>
<td>Affiliation:</td>
<td>NFPA 780 References task group</td>
</tr>
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<td>Street Address:</td>
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<td>Submittal Date:</td>
<td>Mon Jul 07 15:15:23 EDT 2014</td>
</tr>
</tbody>
</table>
12.2.2
All cables and conductors used in enclosed stations and trainways shall emit less than 2 percent acid gas when tested in accordance with UL 2885 Acid Gas, Acidity and Conductivity of Combusted Materials.

Statement of Problem and Substantiation for Public Input

Acid gas is conductive and may cause a short in the electrical equipment intended to perform during fire conditions.

Submitter Information Verification

Submitter Full Name: GILAD SHOSHANI
Organization: RSCC
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 23 08:03:56 EDT 2014
12.2.1  
All wires and cables used shall be listed as being resistant to the spread of fire and shall have reduced smoke emissions, by complying with one of the following:

1. All wires and cables shall comply with the FT4/IEEE 1202 exposure requirements for cable char height, total smoke released, and peak smoke release rate of ANSI/UL 1685.

2. Wires and cables listed as having adequate fire-resistant and low-smoke producing characteristics, by having a flame travel distance that does not exceed 1.5 m (5 ft) and generating a maximum peak optical density of smoke of 0.50 and a maximum average optical density of smoke of 0.15 when tested in accordance with NFPA 262, shall be permitted for use instead of the wires and cables specified in item (1).

Statement of Problem and Substantiation for Public Input

The smoke requirement of UL1685 or NFPA 262 and acid gas requirement applies only to enclosed area and should not be a requirement for an open station or trainways.

Submitter Information Verification

Submitter Full Name: GILAD SHOSHANI  
Organization: RSCC  
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Fri Jun 20 09:39:34 EDT 2014
Public Input No. 38-NFPA 130-2014 [Section No. 12.3.1]

12.3.1 Wires and cables used for power and control shall comply with both of the following temperature and moisture resistance characteristics:

1. All insulations shall conform to NFPA 70 and shall be a moisture- and heat-resistant type carrying a temperature rating of 90°C (194°F).
2. All insulated conductors and cables shall be listed for wet locations.

Statement of Problem and Substantiation for Public Input

The materials used to achieve the electrical characteristics in communication cables such as for Cat 5e and/or Coax cables do not meet these requirements.

Submitter Information Verification

Submitter Full Name: GILAD SHOSHANI
Organization: RSCC
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Fri Jun 20 09:52:41 EDT 2014
12.4.3
Within the emergency ventilation air distribution system, the following wiring methods are acceptable:

(1) Type MI cable without or MI cable with an overall protected nonmetallic covering complying with 12.2.1 and 12.2.2

(2) Type MC cable employing a smooth or corrugated impervious metal sheath without or MC cable with an overall nonmetallic covering complying with 12.2.1 and 12.2.2

(3) Conductors in electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, or rigid metal conduit all without an overall nonmetallic covering

Statement of Problem and Substantiation for Public Input
The standard practice of installing copper sheath cables in enclosed stations and trainways is with an overall jacket. The jacket protects the copper armor from corrosion and prevents copper theft.

Submitter Information Verification
Submitter Full Name: GILAD SHOSHANI
Organization: RSCC
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jun 20 09:57:53 EDT 2014
A.4.5  6
Freight operations are typically subject to regulation by others, and are beyond the scope of this standard. Freight operations can affect life safety from fire hazards due to concurrent operations.

The increased hazard includes the potential for rapid fire development to fire heat release rates that can exceed those of a non-freight vehicle, with combustible loads that might support fires that burn for days. The increased hazard also includes non-fire events involving release of materials hazardous to life. The design process should include information exchange and agreement among the freight operator, the passenger services operator and the authority having jurisdiction.

All concurrent freight and passenger uses should be given consideration. More detailed consideration of the relative life safety from fire hazards is strongly recommended when applied to underground facilities, where the confined nature of the space will magnify the hazards. Consideration should include implications of concurrent uses for freight systems operated through or adjacent to passenger stations and concurrent uses for freight systems operated through or adjacent to passenger trainways.

Statement of Problem and Substantiation for Public Input

The proposed numbering change is to correspond to the re-ordering of material in Chapter 4.

Submitter Information Verification

Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address:
City: 
State: 
Zip: 
Submittal Date: Mon Jul 07 14:40:20 EDT 2014
A.5.2.6.2
Rubbish containers that are used in the station on a temporary basis (e.g., during cleaning operations) should be manufactured of noncombustible materials or of materials that comply with a peak heat release rate not exceeding 300 kW/m² (26.4 Btu/ft²·sec) when tested in accordance with ASTM E 1354. Nonmetallic or plastic rubbish containers should be limited in their combustibility and should be tested for heat release with the cone calorimeter, to the recognized standard of ASTM E 1354 referred to as the cone or oxygen consumption calorimeter. The cone calorimeter test standard does not indicate the exact conditions (heat flux and orientation) needed for testing. This test is intended to give detailed information as to how the fire performance of materials perform under actual fire conditions. The value of 300 kW/m² for peak rate of heat release of the rubbish container material corresponds to the value that Douglas fir wood emits under the same conditions. Rubbish containers are often manufactured of polyethylene (effective heat of combustion ca. 19,000 Btu/lb (45 MJ/kg)), which releases much more heat in a fire than the typical contents of the container, much of which is paper (effective heat of combustion ca. 6400 Btu/lb (15 MJ/kg)). For comparison purposes, Table A.19.2.1.2.1 shows peak heat release rates of a series of materials (34 plastics and Douglas fir wood) at an incident heat flux of 50-40 kW/m² (4.4 Btu/ft²·sec) in the horizontal orientation, m², in the horizontal orientation and at a thickness of 0.25 in. (6 mm) [Hirschler 1992]. For further comparison, a fire test conducted with a small ignition source on a 22.4 lb polyethylene rubbish container resulted in the release of 1.34 MW within 13.35 minutes of ignition (before it had to be manually extinguished) and caused flashover in the test room. The maximum a container can release is 300 kW/m² or maximum heat release rate. Douglas fir has a constant of 300 kW/m² where polyethylene has a peak heat release rate of 1268 kW/m². Nonmetallic containers such as polyethylene can represent more fuel than their contents (high density polyethylene 19,994 Btu/lb versus newsprint at 8000). A detailed review of listings or approvals is advised prior to acceptance. [Extract from NFPA 1, 2012, section A.19.2.1.2.1]


Statement of Problem and Substantiation for Public Input
This brings the annex informational material into the standard as a requirement and brings (as an extract) the information from NFPA 1 as to what the hazard is of normal plastic rubbish containers.

Related Public Inputs for This Document

<table>
<thead>
<tr>
<th>Related Input</th>
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<td>Public Input No. 50-NFPA 130-2014 [Section No. 5.2.6.2]</td>
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Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 30 15:23:16 EDT 2014
A.5.3.3.1
The stipulated time is intended as a baseline for determining the required capacity and maximum travel
distances for platform egress routes. It is not intended that this calculation be required to account for delays
due to products of combustion or debris along an egress route or delays due to the movement of those who
are unable to achieve self-evacuation.

With regard to coordinating this requirement with requirements for tenability as described in Section B.2.2
in Annex B, the intent is for tenability to be evaluated along egress routes once occupants leave the
platform, with the goal of moving all occupants to a point of safety within 6 minutes as stated in Section
5.3.3.2. The evaluation of tenability along the platform should only be required to explore alternatives
where the design does not comply with requirements in Chapter 5—e.g., the required 4 minute platform
clearance time or the common path of travel requirements in Section 5.3.3.6.

Statement of Problem and Substantiation for Public Input
Considering the descriptions included in Annex B.2.2, the proposed Annex A language is to provide guidance with
regard to limits of tenability analysis where the design of platform egress complies with Sections 5.3.3.1, 5.3.3.6
and 5.3.3.7.

Submitter Information Verification
Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 19:02:15 EDT 2014
A.5.3.5.3

For escalators, contribution to the means of egress capacity may be calculated based on one of the following:

1. The width used to calculate the capacity of stopped escalators should be based on the tread width plus the width permitted for intrusion of handrails by NFPA 101—i.e., for a 1000 mm (40 in) tread width, the width used to determine egress capacity will be 1228 mm (48 in.).

2. Where escalators having a nominal width of 1000 mm (40 in.) will be dedicated for operation in the direction of exit travel at speeds of at least 30 m/min (98 ft/min), such escalators can be permitted to be counted as having a capacity of 75 p/min. This should be considered appropriate only in conjunction with other provisions of this standard, such as the requirement to discount one escalator at each station level. Such escalators should also be connected to emergency power. This suggested speed is consistent with the maximum speed permitted in ASME A17.1/CSA B44, a bi-national standard. The suggested capacity is consistent with research reported in the Elevator World article "Escalator Handling Capacity" and in Pedestrian Planning and Design, by Fruin. Other codes regulating transit station design permit escalator capacity to be based on operating capacity (e.g., Ontario Building Code, Section 3.13, "Rapid Transit Stations," and London Underground Ltd., LUL Station Planning Guidelines, which both permit a capacity of 100 p/min.). Designers are encouraged to research the latest available data. Unpublished research suggests that where the vertical rise exceeds 15 m (50 ft), the capacity and travel speed for stairs should be adjusted downward by approximately 30 percent to account for fatigue. Additionally, the design should provide enlarged landings to allow pedestrians to rest without impeding egress flow.

Statement of Problem and Substantiation for Public Input

The proposed change clarifies the intended method for determining the width of escalators used for calculating the available emergency egress capacity.

Submitter Information Verification

Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 15:59:17 EDT 2014
A.7.1.1

This chapter addresses emergency ventilation that may be required for train fire events. The intent is that fire protection and life safety for non-train fire events are addressed by other requirements stipulated elsewhere in this standard or by other applicable requirements. Such measures may include: limits on the combustibility of materials that are permitted to be used, compartmentation, and/or local smoke exhaust.

Separate ventilation systems for tunnels and underground stations can be provided but are not required. Annex B provides information on types of mechanical systems for normal and emergency ventilation of trainways and stations and information for determining a tenable environment.

Statement of Problem and Substantiation for Public Input

The proposed revision is to clarify that Chapter 7 addresses train fires and to indicate how other fire events are addressed in other parts of the standard.

Submitter Information Verification

Submitter Full Name: Katherine Fagerlund
Organization: Sereca Fire Consulting Ltd.
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Mon Jul 07 15:19:20 EDT 2014
A.7.2.1(5)
This is an equipment exposure duration requirement, not a tenability requirement. Tunnel ventilation fans, their motors, and all related components should be designed to remain operational for a minimum of 1 hour. If the time of tenability exceeds 1 hour, then the emergency ventilation system should remain operational for that longer period of time.

Statement of Problem and Substantiation for Public Input

The intent of the requirement is to maintain equipment operations more than tenability.

Submitter Information Verification

Submitter Full Name: Silas Li
Organization: Parsons Brinckerhoff, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 12 14:22:59 EDT 2014
### A.7.2.3.1
Annex H presents background and approaches to the development of fire scenarios and fire profiles.

### Statement of Problem and Substantiation for Public Input
This is part of the Public Input providing minimum requirements concerning the selection of design fires. This refers to a new Annex H.

### Related Public Inputs for This Document

<table>
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<tr>
<th>Related Input</th>
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<td>Public Input No. 69-NFPA 130-2014 [New Section after 3.3.7]</td>
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### Submitter Information Verification

- **Submitter Full Name:** Silas Li
- **Organization:** Parsons Brinckerhoff, Inc.
- **Street Address:**
- **City:**
- **State:**
- **Zip:**
- **Submittal Date:** Mon Jul 07 09:17:49 EDT 2014
A.7.2.5
Transition from fixed-block to moving-block (cab-based or communication-based) signaling is being made by many properties to increase train throughputs during rush hour operation. Ventilation zones are fixed elements, and the number of trains allowed in a single zone affects both ventilation plant requirements and the effectiveness of the ventilation response. Traction power blocks are fixed elements and affect the ability to extract non-incident trains from the incident ventilation zone. Signal system track circuits are fixed elements and affect the ability to determine the location of incident and non-incident trains in the incident ventilation zone. Signal system reversing capability and rapidness of executing a reversal in an emergency are key to the effective extraction of non-incident trains. Due to the potential for a valid incident ventilation response to move smoke past (and engulf) a non-incident train, the best protection to passengers is to allow no more than one train in a ventilation zone. Failing that, there should be a viable extraction capability to remove non-incident trains in the same time frame as the activation of the ventilation response. This extraction requires coordination of the three system elements in terms of design, and with the train operation plans and emergency response plans with respect to how the trains will be operated and how the designed systems will be used during emergency operation. Non-incident trains should be capable of being located and removed from the incident area before the de-energization of the traction power prevents train movement for an extended period or the operation of the ventilation system in response to the fire incident involves the trains in the incident. Examples of the provisions necessary to accomplish this capability are the inclusion of traction power segmentation zones within ventilation zones and the inclusion of sufficiently short track signal circuit lengths to ensure all trains are accurately located.

Additional Proposed Changes

<table>
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<tr>
<th>Description</th>
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<tr>
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Statement of Problem and Substantiation for Public Input

Proposed change adds two operation plan items for consideration in the necessary coordination. The viability of the intended operation plan and emergency response are critical when more than one train is designed to be in a ventilation zone. Such viability can only be achieved when the design and operations planning are integral in the determination of project criteria.

Related Public Inputs for This Document

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<td>Changes related to 7.2.5</td>
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Submitter Information Verification

Submitter Full Name: DAVID PLOTKIN
Organization: AECOM
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 03 12:43:14 EDT 2014
7.2.5* The design and operation of the signaling system, traction power blocks, and ventilation system shall be coordinated among each other and with the Train Operations Plans and Emergency Response Plans to match the total number of trains that could be between ventilation shafts during an emergency.

A.7.2.5 Transition from fixed-block to moving-block (cab-based or communication-based) signaling is being made by many properties to increase train throughputs during rush hour operation. Ventilation zones are fixed elements, and the number of trains allowed in a single zone affects both ventilation plant requirements and the effectiveness of the ventilation response. Traction power blocks are fixed elements and affect the ability to extract non-incident trains from the incident ventilation zone. Signal system track circuits are fixed elements and affect the ability to determine the location of incident and non-incident trains in the incident ventilation zone. Signal system reversing capability and rapidness of executing a reversal in an emergency are key to the effective extraction of non-incident trains. Due to the potential for a valid incident ventilation response to move smoke past (and engulf) a non-incident train, the best protection to passengers is to allow no more than one train in a ventilation zone. Failing that, there should be a viable extraction capability to remove non-incident trains in the same time frame as the activation of the ventilation response. This extraction requires coordination of the three system elements in terms of design, and with the train operation plans and emergency response plans with respect to how the trains will be operated and how the designed systems will be used during emergency operation. Non-incident trains should be capable of being located and removed from the incident area before the de-energization of the traction power prevents train movement for an extended period or the operation of the ventilation system in response to the fire incident involves the trains in the incident. Examples of the provisions necessary to accomplish this capability are the inclusion of traction power segmentation zones within ventilation zones and the inclusion of sufficiently short track signal circuit lengths to ensure all trains are accurately located.

**Substantiation:**

Proposed change adds two operation plan items for consideration in the necessary coordination. The viability of the intended operation plan and emergency response are critical when more than one train is designed to be in a ventilation zone. Such viability can only be achieved when the design and operations planning are integral in the determination of project criteria.
A.7.2.6
Tenability criteria should consider a number of environmental conditions. The time of tenability should consider the possibility of one or more egress paths being blocked by fire or smoke (as may be demonstrated by analysis) and for other considerations that are not accounted for in the egress capacity calculations. (See B.2.3 for additional information to be considered.)

Additional Proposed Changes

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<th>Description</th>
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<td>Related changes for Annex B.2.1.5, consisting of 3.3 additions, 7.2.6 changes, A.7.2.6 changes, Annex H additions</td>
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Statement of Problem and Substantiation for Public Input

For 7.2.6, the Standard’s current mandatory text lacks a requirement to establish project tenability and time-of-tenability criteria for approval.

For A.7.2.6, the Standard’s current advisory text is focused on time-of-tenability, and both overall tenability and the breadth of other tenability considerations addressed in Annex B should be mentioned in the Annex A referral to Annex B. The proposed modifications will strengthen connection between Annex B.2 and mandatory text, to assure that tenability criteria are established to address acoustic concerns not addressed in the current Standard.

For B.2.1.5, the Standard’s current advisory text contains undocumented maximum noise exposure limits and insufficient guidance for communication with and protection of occupants during the emergency evacuation scenario.

The proposed changes add guidance and related values for consideration in fixing project criteria that are found in other established Standards and adapted for the specific environment of this Standard, clarified with noise metrics and measurement parameters, and supported with relevant definitions added in Chapter 3 and references added in Annex H.

Related Public Inputs for This Document

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Submitter Information Verification

Submitter Full Name: DAVID PLOTKIN
Organization: AECOM
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Thu Jul 03 12:20:56 EDT 2014
3.3.xx **Decibel.** The logarithmic units associated with sound pressure level.

3.3.xx **Un-weighted Decibel (dBZ).** Decibel values without weighting applied.

3.3.xx **A-weighted Decibel (dBA).** Decibel values with weighting applied over the frequency range of 20Hz to 20kHz to reflect human hearing.

3.3.xx **Sound Pressure Level.** The logarithmic ratio of the root-mean squared sound pressure to the reference sound pressure (2.0 × 10⁻⁵ Pascals).

3.3.xx **Common Intelligibility Scale (CIS).** See NFPA 72-2013 Annex D.2.4.5.

3.3.xx **Speech Interference Level (SIL).** A calculated quantity providing a guide to the interfering effect of noise on speech intelligibility. One-fourth of the sum of the band sound pressure levels for octave-bands with normal mid-band frequencies of 500, 1000, 2000, and 4000 Hz. Unit, decibel; abbreviation, SIL.

3.3.xx **Speech Transmission Index (STI).** See NFPA 72-2013 Annex D.2.1.1.

3.3.xx **Voice Communication System.** An amplified paging system for speech communication, including emergency notifications and announcements.

3.3.xx **Time Weighted Average (TWA).** The Time Weighted Average sound level is a continuous sound level which, over a defined period, would produce the same noise dose as the varying sound level.

3.3.xx **L<sub>eq</sub>.** Level equivalent, the average sound level over time on an acoustical energy basis

3.3.xx ‘**Slow’**. The response time of a sound level meter’s RMS detector corresponding to a rise time constant of 1 second per ANSI S1.4 and IEC 61672.

7.2.6* The tenability and time-of-tenability criteria for stations and trainways shall be established and approved. For stations, the time shall be greater than the calculated egress time used to establish egress capacity in 5.3.2.1.

A.7.2.6 Tenability criteria should consider a number of environmental conditions. The time of tenability should consider the possibility of one or more egress paths being blocked by fire or smoke (as may be demonstrated by analysis) and for other considerations that are not accounted for in the egress capacity calculations. (See B.2.3 for additional information to be considered.)

B.2.1.5 Noise Levels. Criteria for noise levels should be established for the various situations and potential exposures particular to the environments addressed by this Standard. A maximum of 115 dBA for a few seconds and a maximum of 92 dBA for the remainder of the exposure. The intent of the recommended criteria is to maintain at least a minimal level of speech intelligibility along emergency evacuation routes. This may require additional noise control measures and acoustical treatment to achieve. Exceptions taken to the recommended noise levels for reasons of cost and feasibility should be as few and as slight as reasonably possible. For example, local area exceptions to the recommended acoustic criteria may be required to be applied for defined limited distances along the evacuation path that are near active noise sources. Other means of providing emergency evacuation guidance using acoustic, non-acoustic or combined methods may be considered.

(a) Noise levels should not exceed the following:

The sound pressure level from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface, should not exceed 94 dBA L<sub>eq</sub> ‘slow’ for a period of 1-hour, and should at no time exceed 140

The sound pressure level from all active systems measured where staff would be present for maintenance and testing and where hearing protection is not available should not exceed 85 dBA TWA ‘slow’ for a period of 8-hours, and should at no time exceed 140 dBZ Peak. [ref: 29 CFR 1910.95 (OSHA)]

(b) Where reliance upon unamplified speech is used as part of the emergency response:

The sound interference level (SIL) from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface should not exceed 78 dBZ Leq ‘slow’ over any period of 1 minute, using the arithmetic average of un-weighted sound pressure level in the 500, 1000, 2000 and 4000 Hz octave bands.

(c) For intelligible communication between emergency evacuation responders and the public where reliance upon amplified speech is used as part of the emergency response within a station:

The sound pressure level from all active systems measured inside a station along the path of evacuation during the emergency response at any point five (5) feet above the walking surface where a voice communication system is intended to be used should not exceed the higher of 70 dBA Leq ‘slow’ measured over any 1 minute period or 10 dB below the measured voice communication system sound pressure level in the octave bands greater than 63 Hz with a steady-state red noise input signal set to the maximum A-weighted setting of the voice communication system (if the voice communication system has an ambient sensing microphone).

The speech intelligibility of voice communication systems under the same conditions and for the same spaces, should achieve a measured STI of not less than 0.45 (0.65 CIS), and an average STI of not less than 0.5 (0.7 CIS) as per NFPA 72-2013 Annex D.2.4.1. Refer to NFPA 72-2013 Annex D for further information on Speech Intelligibility for voice communication systems. The STI criterion is more stringent than the noise level limit and may require additional noise control measures and acoustical treatment to achieve.

(d) Where reliance upon amplified speech is used as part of the emergency response within a tunnel:

Where a voice communication system is intended to be used within a tunnel, the sound pressure level from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface should not exceed 75 dBA Leq ‘slow’ measured over any period of 1 minute.

The speech intelligibility of fixed voice communication systems under the same conditions and for the same spaces, should achieve a measured STI of not less than 0.45 (0.65 CIS), and an average STI of not less than 0.5 (0.7 CIS) as per NFPA 72-2013 Annex D.2.4.1. Refer to NFPA 72-2013 Annex D for further information on Speech Intelligibility for voice communication systems. The STI criterion is more stringent than the noise level limit and may require additional noise control measures and acoustical treatment to achieve.

**H.1.2.8 ISO Publications [and renumber]**

H.1.2.9 OSHA Publications [and renumber]

H.1.2.11 Other Publications


Substantiation
For 7.2.6, the Standard’s current mandatory text lacks a requirement to establish project tenability and time-of-tenability criteria for approval.

For A.7.2.6, the Standard’s current advisory text is focused on time-of-tenability, and both overall tenability and the breadth of other tenability considerations addressed in Annex B should be mentioned in the Annex A referral to Annex B. The proposed modifications will strengthen connection between Annex B.2 and mandatory text, to assure that tenability criteria are established to address acoustic concerns not addressed in the current Standard.

For B.2.1.5, the Standard’s current advisory text contains undocumented maximum noise exposure limits and insufficient guidance for communication with and protection of occupants during the emergency evacuation scenario.

The proposed changes add guidance and related values for consideration in fixing project criteria that are found in other established Standards and adapted for the specific environment of this Standard, clarified with noise metrics and measurement parameters, and supported with relevant definitions added in Chapter 3 and references added in Annex H.
A8.9.4 Lightning Protection
Guidance is provided in NFPA 780, Standard for the Installation of Lightning Protection Systems, for determining the need for lightning protection.

Statement of Problem and Substantiation for Public Input

Lightning Protection for structures and electronics is covered in NFPA 780-2014 edition. The addition of just a surge protection device to the electrical main should not be construed as Lightning protection. A reference to the NFPA 780 document and the risk assessment provided in it, can help a designer/user of NFPA 130 to understand and mitigate the hazard of lightning for both the structure and the electrical system.

Submitter Information Verification

Submitter Full Name: Mark Morgan
Organization: East Coast Lightning Equipment
Affiliation: NFPA 780 References task group
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 07 15:31:32 EDT 2014
B.2.1.5 Noise Levels.

Criteria for noise levels should be established for the various situations and potential exposures particular to the environments addressed by this Standard. The intent of the recommended criteria is to maintain at least a minimal level of speech intelligibility along emergency evacuation routes. This may require additional noise control measures and acoustical treatment to achieve. Exceptions taken to the recommended noise levels for reasons of cost and feasibility should be as few and as slight as reasonably possible. For example, local area exceptions to the recommended acoustic criteria may be required to be applied for defined limited distances along the evacuation path that are near active noise sources. Other means of providing emergency evacuation guidance using acoustic, non-acoustic or combined methods may be considered.

(a) Noise levels should not exceed the following:

The sound pressure level from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface, should not exceed 94 dBA L_{eq} ‘slow’ for a period of 1-hour, and should at no time exceed 140 dBZ Peak. [ref: ISO 1999:2013 and EU Directive 2003/10/EC, Canada Occupational Safety and Health Regulations, (SOR/86-304) Part VII]

The sound pressure level from all active systems measured where staff would be present for maintenance and testing and where hearing protection is not available should not exceed 85 dBA TWA ‘slow’ for a period of 8-hours, and should at no time exceed 140 dBZ Peak. [ref: 29 CFR 1910.95 (OSHA)]

(b) Where reliance upon unamplified speech is used as part of the emergency response:

The sound interference level (SIL) from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface should not exceed 78 dBZ L_{eq} ‘slow’ over any period of 1 minute, using the arithmetic average of un-weighted sound pressure level in the 500, 1000, 2000 and 4000 Hz octave bands.

(c) For intelligible communication between emergency evacuation responders and the public where reliance upon amplified speech is used as part of the emergency response within a station:

The sound pressure level from all active systems measured inside a station along the path of evacuation during the emergency response at any point five (5) feet above the walking surface where a voice communication system is intended to be used should not exceed the higher of 70 dBA L_{eq} ‘slow’ measured over any 1 minute period or 10 dB below the measured voice communication system sound pressure level in the octave bands greater than 63 Hz with a steady-state red noise input signal set to the maximum of 115 dBA for a few seconds and a maximum of 92 dBA for the remainder of the exposure A-weighted setting of the voice communication system (if the voice communication system has an ambient sensing microphone).

The speech intelligibility of voice communication systems under the same conditions and for the same spaces, should achieve a measured STI of not less than 0.45 (0.65 CIS), and an average STI of not less than 0.5 (0.7 CIS) as per NFPA 72-2013 Annex D.2.4.1. Refer to NFPA 72-2013 Annex D for further information on Speech Intelligibility for voice communication systems.

The STI criterion is more stringent than the noise level limit and may require additional noise control measures and acoustical treatment to achieve.

(d) Where reliance upon amplified speech is used as part of the emergency response within a tunnel:

Where a voice communication system is intended to be used within a tunnel, the sound pressure level from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface should not exceed -75 dBA L_{eq} ‘slow’ measured over any period of 1 minute.

The speech intelligibility of fixed voice communication systems under the same conditions and for the same spaces, should achieve a measured STI of not less than 0.45 (0.65 CIS), and an average STI of not less than 0.5 (0.7 CIS) as per NFPA 72-2013 Annex D.2.4.1. Refer to NFPA 72-2013 Annex D for further information on Speech Intelligibility for voice communication systems.

The STI criterion is more stringent than the noise level limit and may require additional noise control measures and acoustical treatment to achieve.
Statement of Problem and Substantiation for Public Input

For 7.2.6, the Standard’s current mandatory text lacks a requirement to establish project tenability and time-of-tenability criteria for approval.

For A.7.2.6, the Standard’s current advisory text is focused on time-of-tenability, and both overall tenability and the breadth of other tenability considerations addressed in Annex B should be mentioned in the Annex A referral to Annex B. The proposed modifications will strengthen connection between Annex B.2 and mandatory text, to assure that tenability criteria are established to address acoustic concerns not addressed in the current Standard.

For B.2.1.5, the Standard’s current advisory text contains undocumented maximum noise exposure limits and insufficient guidance for communication with and protection of occupants during the emergency evacuation scenario.

The proposed changes add guidance and related values for consideration in fixing project criteria that are found in other established Standards and adapted for the specific environment of this Standard, clarified with noise metrics and measurement parameters, and supported with relevant definitions added in Chapter 3 and references added in Annex H.

Related Public Inputs for This Document

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<td>Public Input No. 65-NFPA 130-2014 [Section No. H.1.2]</td>
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Submitter Information Verification

Submitter Full Name: DAVID PLOTKIN
Organization: AECOM
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 03 12:24:16 EDT 2014
3.3.xx **Decibel.** The logarithmic units associated with sound pressure level.

3.3.xx **Un-weighted Decibel (dBZ).** Decibel values without weighting applied.

3.3.xx **A-weighted Decibel (dBA).** Decibel values with weighting applied over the frequency range of 20Hz to 20kHz to reflect human hearing.

3.3.xx **Sound Pressure Level.** The logarithmic ratio of the root-mean squared sound pressure to the reference sound pressure ($2.0 \times 10^{-5}$ Pascals).

3.3.xx **Common Intelligibility Scale (CIS).** See NFPA 72-2013 Annex D.2.4.5.

3.3.xx **Speech Interference Level (SIL).** A calculated quantity providing a guide to the interfering effect of noise on speech intelligibility. One-fourth of the sum of the band sound pressure levels for octave-bands with normal mid-band frequencies of 500, 1000, 2000, and 4000 Hz. Unit, decibel; abbreviation, SIL.

3.3.xx **Speech Transmission Index (STI).** See NFPA 72-2013 Annex D.2.1.1.

3.3.xx **Voice Communication System.** An amplified paging system for speech communication, including emergency notifications and announcements.

3.3.xx **Time Weighted Average (TWA).** The Time Weighted Average sound level is a continuous sound level which, over a defined period, would produce the same noise dose as the varying sound level.

3.3.xx **L$_{eq}$**. Level equivalent, the average sound level over time on an acoustical energy basis.

3.3.xx ‘**Slow**’. The response time of a sound level meter’s RMS detector corresponding to a rise time constant of 1 second per ANSI S1.4 and IEC 61672.

7.2.6* The tenability and time-of-tenability criteria for stations and trainways shall be established and approved. For stations, the time shall be greater than the calculated egress time used to establish egress capacity in 5.3.2.1.

A.7.2.6 Tenability criteria should consider a number of environmental conditions. The time of tenability should consider the possibility of one or more egress paths being blocked by fire or smoke (as may be demonstrated by analysis) and for other considerations that are not accounted for in the egress capacity calculations. (See B.2.3 for additional information to be considered.)

B.2.1.5 Noise Levels. Criteria for noise levels should be established for the various situations and potential exposures particular to the environments addressed by this Standard. A maximum of 115 dBA for a few seconds and a maximum of 92 dBA for the remainder of the exposure. The intent of the recommended criteria is to maintain at least a minimal level of speech intelligibility along emergency evacuation routes. This may require additional noise control measures and acoustical treatment to achieve. Exceptions taken to the recommended noise levels for reasons of cost and feasibility should be as few and as slight as reasonably possible. For example, local area exceptions to the recommended acoustic criteria may be required to be applied for defined limited distances along the evacuation path that are near active noise sources. Other means of providing emergency evacuation guidance using acoustic, non-acoustic or combined methods may be considered.

(a) Noise levels should not exceed the following:

The sound pressure level from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface, should not exceed 94 dBA L$_{eq}$ ‘slow’ for a period of 1-hour, and should at no time exceed 140
The sound pressure level from all active systems measured where staff would be present for maintenance and testing and where hearing protection is not available should not exceed 85 dBA TWA ‘slow’ for a period of 8-hours, and should at no time exceed 140 dBZ Peak. [ref: 29 CFR 1910.95 (OSHA)]

(b) Where reliance upon unamplified speech is used as part of the emergency response:

The sound interference level (SIL) from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface should not exceed 78 dBZ L_{eq} ‘slow’ over any period of 1 minute, using the arithmetic average of un-weighted sound pressure level in the 500, 1000, 2000 and 4000 Hz octave bands.

(c) For intelligible communication between emergency evacuation responders and the public where reliance upon amplified speech is used as part of the emergency response within a station:

The sound pressure level from all active systems measured inside a station along the path of evacuation during the emergency response at any point five (5) feet above the walking surface where a voice communication system is intended to be used should not exceed the higher of 70 dBA L_{eq} ‘slow’ measured over any 1 minute period or 10 dB below the measured voice communication system sound pressure level in the octave bands greater than 63 Hz with a steady-state red noise input signal set to the maximum A-weighted setting of the voice communication system (if the voice communication system has an ambient sensing microphone).

The speech intelligibility of voice communication systems under the same conditions and for the same spaces, should achieve a measured STI of not less than 0.45 (0.65 CIS), and an average STI of not less than 0.5 (0.7 CIS) as per NFPA 72-2013 Annex D.2.4.1. Refer to NFPA 72-2013 Annex D for further information on Speech Intelligibility for voice communication systems.

The STI criterion is more stringent than the noise level limit and may require additional noise control measures and acoustical treatment to achieve.

(d) Where reliance upon amplified speech is used as part of the emergency response within a tunnel:

Where a voice communication system is intended to be used within a tunnel, the sound pressure level from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface should not exceed 75 dBA L_{eq} ‘slow’ measured over any period of 1 minute.

The speech intelligibility of fixed voice communication systems under the same conditions and for the same spaces, should achieve a measured STI of not less than 0.45 (0.65 CIS), and an average STI of not less than 0.5 (0.7 CIS) as per NFPA 72-2013 Annex D.2.4.1. Refer to NFPA 72-2013 Annex D for further information on Speech Intelligibility for voice communication systems.

The STI criterion is more stringent than the noise level limit and may require additional noise control measures and acoustical treatment to achieve.

**H.1.2.8 ISO Publications [and renumber]**

H.1.2.9 OSHA Publications [and renumber]

H.1.2.11 Other Publications


Substantiation

For 7.2.6, the Standard’s current mandatory text lacks a requirement to establish project tenability and time-of-tenability criteria for approval.

For A.7.2.6, the Standard’s current advisory text is focused on time-of-tenability, and both overall tenability and the breadth of other tenability considerations addressed in Annex B should be mentioned in the Annex A referral to Annex B. The proposed modifications will strengthen connection between Annex B.2 and mandatory text, to assure that tenability criteria are established to address acoustic concerns not addressed in the current Standard.

For B.2.1.5, the Standard’s current advisory text contains undocumented maximum noise exposure limits and insufficient guidance for communication with and protection of occupants during the emergency evacuation scenario.

The proposed changes add guidance and related values for consideration in fixing project criteria that are found in other established Standards and adapted for the specific environment of this Standard, clarified with noise metrics and measurement parameters, and supported with relevant definitions added in Chapter 3 and references added in Annex H.
Annex H Fire Scenarios and Fire Profiles

This annex is not part of the requirements of this NFPA document but is included for informational purposes only.

H.1 Introduction

This annex presents information on fire scenarios and methodologies used for predicting fire profiles. The engineering approach for predicting fire profiles has changed over time. Because this is a rapidly developing field, designers should be careful to justify the appropriateness of the methodology selected.

H.2 Fire Scenarios

Representative design fire scenarios include the following:

1. A fire originates outside the vehicle interior, such as below the floor or rooftop. The fire causes the train to stop in a tunnel or station, and could burn through the floor or rooftop into the vehicle’s interior.

2. A fire originates in a vehicle’s interior. Some recent train fire studies suggest that a NFPA 130-compliant car will not flashover, unless the event is initiated with two or more liters of a flammable liquid or accelerant. The designer should verify this possibility, as ventilation requirements can vary greatly depending on flashover expectations.

3. Car-to-Car Fire Spread. The fire may spread from car to car. Parameters that affect this are the fire resistances of the car ends, whether the interior car doors are left open or closed, whether the cars have “bellows” connecting them or not, the tunnel ventilation moving the heat from the fire site downstream to the next car, whether the car exterior windows are glass or polycarbonate, whether the station has sprinklers or not.

4. A fire consumes trash, luggage, wayside electrical equipment, etc. in the stations or tunnels.

5. A fire occurs in a non-transit occupancy that is not protected by sprinklers, such as a kiosk or small shop.

6. A fire in a dual-powered vehicle (diesel and electric traction) results from the puncture of a fuel tank or rupture of a fuel line.

7. A fire originates in a maintenance vehicle or work-train. If maintenance vehicles are never in the stations or tunnels during periods of revenue operations, then maintenance vehicle or work train fire scenarios do not have to be considered as design fire scenarios.

H.3 Fire Profiles

As per Section 7.2.1 (2), critical velocity is the criteria for determining the required tunnel airflow and hence the ventilation system fan capacities required for tunnel fire incidents. The most commonly used software is the Subway Environment Simulation (SES) computer program [1]. The peak fire heat release rate is the primary “fire” input.

Tenability in stations is usually predicted by computational fluid dynamics (CFD) programs. The design fire profile is an input to the CFD programs which predict temperatures, visibilities, and carbon monoxide concentrations as a function of the three-dimensional location in the station and time since the initiation of the fire. Any combustible materials that could contribute to the fire load at the incident site should also be evaluated.

Several references provided a reasonably good overview of a number of methodologies for predicting design fire profiles [2][3][4]. More recent methodologies include, but not limited to, the following:

1. CFD Modeling of Fire Profiles with Cone Calorimeter Tests of Train Materials

This methodology includes cone-calorimeter tests of train materials, and computer modeling of fire growth and decay for a fire originated in a train’s interior in the presence of accelerants. Several CFD programs have been used in predicting fire profiles for transit and rail projects in the United States since 2005. The CFD programs are validated for their intended use, and predict pre- and post-flashover fire profiles. When selecting a computer program, it is important to select the program that best fits the need of the problem rather than to select the program based on availability. The following conditions should be considered when building a CFD model for predicting fire profiles: 1) quantity and properties of accelerants; 2) fire...
characteristic of car interior materials measured according to ASTM E1354; 3) the layout of the car interiors including seating layouts, orientations and dimensions; 4) bags and luggage carried by passengers; 5) overall thermal transmission value for vehicle body; 6) openings, including windows and doors; 7) oxygen levels; and 8) mechanical and natural ventilation.

(2) Full-Scale Fire Tests

A handful of full-scale train fire tests have yielded data to estimate the fire profiles. The 1995 EUREKA project [5] showed that an intercity train reached a peak fire heat release rate of 12 MW in 25 minutes, while a Metro train car reached a peak fire heat release rate of 35 MW in 5 minutes. A Baku Metro train fire (Azerbaijan, 1995) was estimated to reach 100 MW in about 30-45 minutes, and in 2002 a Frankfurt Metro fire model reached 5.6 MW in 30 minutes [3]. The fire profile studies focused on accidental fires such as debris or transient car loadings becoming ignited, or mechanical failure causing the train car itself to ignite. More recent full-scale fire tests have focused on fires where a deliberate attempt was made to ignite and flashover the train car. The full-scale fire tests in Sweden [6] used a commuter train and found that the maximum fire heat release rate of 76.7 MW was achieved in 12.7 minutes in one of the tests, and the corresponding value for another test with the train walls and ceiling covered by aluminum was 77.4 MW occurred at 117.9 minutes after ignition. The general shape of the two fire curves are almost the same. Other full-scale fire tests in Canada used a subway car which reached a maximum FHRR of 52.5 MW in 2.3 minutes, and a railway car which reached a peak FHRR of 32 MW in 18 minutes [7]. A fourth test was performed in Australia, where a passenger rail car reached a maximum FHRR of 13 MW in 2.3 minutes [8].

H.4 Impacts on Ventilation System Design.

The train fire profile has a major impact on the station and tunnel ventilation design. The design fire scenarios and fire profiles should be determined based on the perceived threats. In response to increased awareness that transit and passenger rail systems are potential terrorist targets, some systems are designed for significant incendiary fires and others do not. The decision could be based on cost, the inferred risk or a formal threat and vulnerability assessment.

H.5 References. The following references are cited in this annex.


(3) Chiam, Boon Hui, Numerical Simulation of a Metro Train Fire, Fire Engineering Research Report 05/1, Department of Civil Engineering, University of Canterbury, Christchurch, New Zealand, June 2005.


Statement of Problem and Substantiation for Public Input

This is part of a Public Input providing minimum requirements concerning the selection of design fires. A new
Annex H is added.

### Related Public Inputs for This Document

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### Submitter Information Verification

- **Submitter Full Name:** Silas Li
- **Organization:** Parsons Brinckerhoff, Inc.
- **Submittal Date:** Thu Jul 03 15:11:16 EDT 2014
H.1.2 Other Publications.

H.1.2.1 ANSI/ASME Publications.


H.1.2.1.1


H.1.2.2 APTA Publications.


H.1.2.3 ASHRAE Publications.
ASHRAE, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305.

ASHRAE Handbook Series.

H.1.2.4 ASTM Publications.
ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.


H.1.2.5 EN Publications.
CENELEC, 35, Rue de Stassartstraat, B-1050, Brussels, Belgium.


H.1.2.6 FAA Publications.

FAR 25.853(c), Oil Burner Test for Seat Cushions.
H.1.2.7 FTA Publications.
Federal Transit Administration, 400 7th Street SW, Washington, DC 20590.

H.1.2.8 NIST Publications.
National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD 20899-1070.

H.1.2.9 SFPE Publications.
Society of Fire Protection Engineers, 7315 Wisconsin Avenue, Suite 1225 W, Bethesda, MD 20814.

H.1.2.10 TDC Publications.
Transit Development Corporation, Inc., 1666 K St. NW, Washington, DC 20006.
Associated Engineers: A joint venture by Parsons Brinckerhoff Quade & Douglas, Inc.; Deleuw, Cather and Company; and Kaiser Engineers under the direction of TDC, Inc.

H.1.2.11 Other Publications.

Statement of Problem and Substantiation for Public Input
Updated edition years.

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## Submitter Information Verification

Submitter Full Name: Aaron Adamczyk  
Organization: [ Not Specified ]  
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Mon Jun 09 20:02:13 EDT 2014
H.1.2  Other Publications.

H.1.2.8 ISO Publications [and renumber]


H.1.2.9 OSHA Publications [and renumber]


H.1.2.11 Other Publications


H.1.2.1 ANSI Publications.

American National Standards Institute, Inc., 25 West 43rd Street, 4th Floor, New York, NY 10036.


H.1.2.1.1


H.1.2.2 APTA Publications.


H.1.2.3 ASHRAE Publications.

ASHRAE, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305.

ASHRAE Handbook Series.

H.1.2.4  ASTM Publications.
ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

H.1.2.5  EN Publications.
CENELEC, 35, Rue de Stassartstraat, B-1050, Brussels, Belgium.

H.1.2.6  FAA Publications.
FAR 25.853(c), Oil Burner Test for Seat Cushions.

H.1.2.7  FTA Publications.
Federal Transit Administration, 400 7th Street SW, Washington, DC 20590.

H.1.2.8  NIST Publications.
National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD 20899-1070.

H.1.2.9  SFPE Publications.
Society of Fire Protection Engineers, 7315 Wisconsin Avenue, Suite 1225 W, Bethesda, MD 20814.

H.1.2.10  TDC Publications.
Transit Development Corporation, Inc., 1666 K St. NW, Washington, DC 20006.
Associated Engineers: A joint venture by Parsons Brinckerhoff Quade & Douglas, Inc.; Deleuw, Cather and Company; and Kaiser Engineers under the direction of TDC, Inc.
H.1.2.11 Other Publications.


Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

For 7.2.6, the Standard’s current mandatory text lacks a requirement to establish project tenability and time-of-tenability criteria for approval.

For A.7.2.6, the Standard’s current advisory text is focused on time-of-tenability, and both overall tenability and the breadth of other tenability considerations addressed in Annex B should be mentioned in the Annex A referral to Annex B. The proposed modifications will strengthen connection between Annex B.2 and mandatory text, to assure that tenability criteria are established to address acoustic concerns not addressed in the current Standard.

For B.2.1.5, the Standard’s current advisory text contains undocumented maximum noise exposure limits and insufficient guidance for communication with and protection of occupants during the emergency evacuation scenario.
The proposed changes add guidance and related values for consideration in fixing project criteria that are found in other established Standards and adapted for the specific environment of this Standard, clarified with noise metrics and measurement parameters, and supported with relevant definitions added in Chapter 3 and references added in Annex H.

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</table>

### Submitter Information Verification

- **Submitter Full Name:** DAVID PLOTKIN
- **Organization:** AECOM
- **Street Address:**
- **City:**
- **State:**
- **Zip:**
- **Submittal Date:** Thu Jul 03 12:33:27 EDT 2014
3.3.xx **Decibel.** The logarithmic units associated with sound pressure level.

3.3.xx **Un-weighted Decibel (dBZ).** Decibel values without weighting applied.

3.3.xx **A-weighted Decibel (dBA).** Decibel values with weighting applied over the frequency range of 20Hz to 20kHz to reflect human hearing.

3.3.xx **Sound Pressure Level.** The logarithmic ratio of the root-mean squared sound pressure to the reference sound pressure (2.0 × 10⁻⁵ Pascals).

3.3.xx **Common Intelligibility Scale (CIS).** See NFPA 72-2013 Annex D.2.4.5.

3.3.xx **Speech Interference Level (SIL).** A calculated quantity providing a guide to the interfering effect of noise on speech intelligibility. One-fourth of the sum of the band sound pressure levels for octave-bands with normal mid-band frequencies of 500, 1000, 2000, and 4000 Hz. Unit, decibel; abbreviation, SIL.

3.3.xx **Speech Transmission Index (STI).** See NFPA 72-2013 Annex D.2.1.1.

3.3.xx **Voice Communication System.** An amplified paging system for speech communication, including emergency notifications and announcements.

3.3.xx **Time Weighted Average (TWA).** The Time Weighted Average sound level is a continuous sound level which, over a defined period, would produce the same noise dose as the varying sound level.

3.3.xx **L_eq.** Level equivalent, the average sound level over time on an acoustical energy basis

3.3.xx **‘Slow’.** The response time of a sound level meter’s RMS detector corresponding to a rise time constant of 1 second per ANSI S1.4 and IEC 61672.

7.2.6* The tenability and time-of-tenability criteria for stations and trainways shall be established and approved. For stations, the time shall be greater than the calculated egress time used to establish egress capacity in 5.3.2.1.

A.7.2.6 Tenability criteria should consider a number of environmental conditions. The time of tenability should consider the possibility of one or more egress paths being blocked by fire or smoke (as may be demonstrated by analysis) and for other considerations that are not accounted for in the egress capacity calculations. (See B.2.3 for additional information to be considered.)

B.2.1.5 Noise Levels. Criteria for noise levels should be established for the various situations and potential exposures particular to the environments addressed by this Standard. A maximum of 115 dBA for a few seconds and a maximum of 92 dBA for the remainder of the exposure. The intent of the recommended criteria is to maintain at least a minimal level of speech intelligibility along emergency evacuation routes. This may require additional noise control measures and acoustical treatment to achieve. Exceptions taken to the recommended noise levels for reasons of cost and feasibility should be as few and as slight as reasonably possible. For example, local area exceptions to the recommended acoustic criteria may be required to be applied for defined limited distances along the evacuation path that are near active noise sources. Other means of providing emergency evacuation guidance using acoustic, non-acoustic or combined methods may be considered.

(a) Noise levels should not exceed the following:

The sound pressure level from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface, should not exceed 94 dBA L_eq ‘slow’ for a period of 1-hour, and should at no time exceed 140
The sound pressure level from all active systems measured where staff would be present for maintenance and testing and where hearing protection is not available should not exceed 85 dBA TWA ‘slow’ for a period of 8-hours, and should at no time exceed 140 dBZ Peak.  [ref: 29 CFR 1910.95 (OSHA)]

(b) Where reliance upon unamplified speech is used as part of the emergency response:

The sound interference level (SIL) from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface should not exceed 78 dBZ L_{eq} ‘slow’ over any period of 1 minute, using the arithmetic average of un-weighted sound pressure level in the 500, 1000, 2000 and 4000 Hz octave bands.

(c) For intelligible communication between emergency evacuation responders and the public where reliance upon amplified speech is used as part of the emergency response within a station:

The sound pressure level from all active systems measured inside a station along the path of evacuation during the emergency response at any point five (5) feet above the walking surface where a voice communication system is intended to be used should not exceed the higher of 70 dBA L_{eq} ‘slow’ measured over any 1 minute period or 10 dB below the measured voice communication system sound pressure level in the octave bands greater than 63 Hz with a steady-state red noise input signal set to the maximum A-weighted setting of the voice communication system (if the voice communication system has an ambient sensing microphone).

The speech intelligibility of voice communication systems under the same conditions and for the same spaces, should achieve a measured STI of not less than 0.45 (0.65 CIS), and an average STI of not less than 0.5 (0.7 CIS) as per NFPA 72-2013 Annex D.2.4.1. Refer to NFPA 72-2013 Annex D for further information on Speech Intelligibility for voice communication systems.

The STI criterion is more stringent than the noise level limit and may require additional noise control measures and acoustical treatment to achieve.

(d) Where reliance upon amplified speech is used as part of the emergency response within a tunnel:

Where a voice communication system is intended to be used within a tunnel, the sound pressure level from all active systems measured inside a tunnel along the path of evacuation during the emergency response at any point five (5) feet above the walking surface should not exceed 75 dBA L_{eq} ‘slow’ measured over any period of 1 minute.

The speech intelligibility of fixed voice communication systems under the same conditions and for the same spaces, should achieve a measured STI of not less than 0.45 (0.65 CIS), and an average STI of not less than 0.5 (0.7 CIS) as per NFPA 72-2013 Annex D.2.4.1. Refer to NFPA 72-2013 Annex D for further information on Speech Intelligibility for voice communication systems.

The STI criterion is more stringent than the noise level limit and may require additional noise control measures and acoustical treatment to achieve.

H.1.2.8 ISO Publications [and renumber]

H.1.2.9 OSHA Publications [and renumber]


H.1.2.11 Other Publications


Substantiation

For 7.2.6, the Standard’s current mandatory text lacks a requirement to establish project tenability and time-of-tenability criteria for approval.

For A.7.2.6, the Standard’s current advisory text is focused on time-of-tenability, and both overall tenability and the breadth of other tenability considerations addressed in Annex B should be mentioned in the Annex A referral to Annex B. The proposed modifications will strengthen connection between Annex B.2 and mandatory text, to assure that tenability criteria are established to address acoustic concerns not addressed in the current Standard.

For B.2.1.5, the Standard’s current advisory text contains undocumented maximum noise exposure limits and insufficient guidance for communication with and protection of occupants during the emergency evacuation scenario.

The proposed changes add guidance and related values for consideration in fixing project criteria that are found in other established Standards and adapted for the specific environment of this Standard, clarified with noise metrics and measurement parameters, and supported with relevant definitions added in Chapter 3 and references added in Annex H.
Public Input No. 6-NFPA 130-2014 [Section No. H.1.2.3]

H.1.2.3  ASHRAE Publications.
ASHRAE, American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1791 Tullie Circle, NE, Atlanta, GA 30329-2305.

Additional Proposed Changes

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<td>130_Ferguson_SCF_ASHRAE_Proposal_Form.pdf</td>
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Statement of Problem and Substantiation for Public Input

There are outdated references to various ASHRAE documents, this proposal seeks to update the reference to the most recent published version of those documents.

In addition, there's a reference to the "ASHRAE Handbook Series", but only three of the four handbooks are specifically listed (leaving out the Refrigeration handbook (2010 or 2014)). It would be more appropriate to reference the individual books, rather than a generic group of books. The current reference would be like referring to all volumes of the Encyclopedia. This makes the reference more precise.

Submitter Information Verification

Submitter Full Name: STEVEN FERGUSON
Organization: ASHRAE
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jan 31 09:52:37 EST 2014
Public Input No. 47-NFPA 130-2014 [ Section No. H.1.2.4 ]

H.1.2.4 ASTM Publications.
ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.


Statement of Problem and Substantiation for Public Input

standard date updates

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Fri Jun 27 18:43:36 EDT 2014
H.1.2.4  ASTM Publications.
ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

Statement of Problem and Substantiation for Public Input
Update the year date for standard(s)

Submitter Information Verification
Submitter Full Name: Steve Mawn
Organization: ASTM International
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Mon Jul 07 10:20:39 EDT 2014
Attachment #3:
Committee Roster
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Company/Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harold L. Levitt</td>
<td>Chair</td>
<td>Port Authority of New York &amp; New Jersey PATH Department One PATH Plaza-8th Floor Jersey City, NJ 07306 Alternate: Martha K. Gulick</td>
</tr>
<tr>
<td>David M. Casselman</td>
<td>Principal</td>
<td>Lea &amp; Elliott, Inc. 2505 North State Highway 360, Suite 750 Grand Prairie, TX 75050 Alternate: Robert W. Falvey</td>
</tr>
<tr>
<td>John F. Devlin</td>
<td>Principal</td>
<td>Aon Fire Protection Engineering Corporation 6305 Ivy Lane, Suite 220 Greenbelt, MD 20770 Alternate: Ervin Cui</td>
</tr>
<tr>
<td>William P. Grizard</td>
<td>Principal</td>
<td>American Public Transportation Association 1666 K Street NW, Suite 1100 Washington, DC 20006</td>
</tr>
<tr>
<td>Sean P. Hunt</td>
<td>Principal</td>
<td>Hughes Associates/RJA Group 3610 Commerce Drive, Suite 817 Baltimore, MD 21227-1652 Alternate: Michael J. Ferreira</td>
</tr>
<tr>
<td>William E. Koffel</td>
<td>Principal</td>
<td>Koffel Associates, Inc. 8815 Centre Park Drive, Suite 200 Columbia, MD 21045-2107 Automatic Fire Alarm Association, Inc. Alternate: Daniel P. Finnegan</td>
</tr>
<tr>
<td>Jarrod Alston</td>
<td>Principal</td>
<td>Arup 955 Massachusetts Avenue Cambridge, MA 02139 Alternate: James R. Quiter</td>
</tr>
<tr>
<td>Mark Chan</td>
<td>Principal</td>
<td>Bay Area Rapid Transit District (BART) System Safety Department 300 Lakeside Drive Oakland, CA 94612 Alternate: Joshua Teo</td>
</tr>
<tr>
<td>Charles J. Giblin III</td>
<td>Principal</td>
<td>Maryland State Fire Marshal’s Office 1201 Reisterstown Road Pikesville, MD 21208 International Fire Marshals Association</td>
</tr>
<tr>
<td>Kevin P. Harrison</td>
<td>Principal</td>
<td>Fire Department City of New York 71 Mount Salem Road Port Jervis, NY 12771 Alternate: Anthony Tedesco</td>
</tr>
<tr>
<td>Thomas P. Kenny</td>
<td>Principal</td>
<td>New York City Transit Authority 2 Broadway, Room D.5.54 New York, NY 10004 Metropolitan Transportation Authority User Alternate: Donald Iannuzzi</td>
</tr>
<tr>
<td>Joseph F. Krempasky</td>
<td>Principal</td>
<td>Washington Metropolitan Area Transit Authority (WMATA) 600 Fifth Street, NW Washington, DC 20001 Alternate: Neil E. Nott</td>
</tr>
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### Address List No Phone

#### Fixed Guideway Transit and Passenger Rail Systems

<table>
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<tr>
<th>Name</th>
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<tr>
<td>Pierre Laurin</td>
<td>Principal</td>
<td>FKT-AAA Principal, Toronto Transit Commission, 5140 Yonge Street, 6th Floor, 5140 Yonge Street, 6th Floor, Toronto, ON M2N 6L6 Canada</td>
<td>Pierre Laurin</td>
</tr>
<tr>
<td>David Mao</td>
<td>Principal</td>
<td>FKT-AAA Principal, US Department of Transportation, Federal Railroad Administration, 1200 New Jersey Avenue, SE RRS-14 MS-25 Room W35-311</td>
<td>David Mao</td>
</tr>
<tr>
<td>Luc Martineau</td>
<td>Principal</td>
<td>FKT-AAA Principal, Societe de Transport de Montreal (STM) 2000 Berri 4th Floor, Montreal, QC H2L 4V7 Canada</td>
<td>Luc Martineau</td>
</tr>
<tr>
<td>Richard D. Peacock</td>
<td>Principal</td>
<td>FKT-AAA Principal, US National Institute of Standards &amp; Technology Engineering Laboratory, 100 Bureau Drive Stop 8664, Gaithersburg, MD 20899-8664</td>
<td>Richard D. Peacock</td>
</tr>
<tr>
<td>Silas K. Li</td>
<td>Principal</td>
<td>FKT-AAA Principal, Parsons Brinckerhoff Inc., One Penn Plaza, New York, NY 10119</td>
<td>Silas K. Li</td>
</tr>
<tr>
<td>Thomas G. Middlebrook</td>
<td>Principal</td>
<td>FKT-AAA Principal, MMM Group Limited 100 Commerce Valley Drive West, Thornhill, ON L3T 0A1 Canada</td>
<td>Thomas G. Middlebrook</td>
</tr>
<tr>
<td>John Nelsen</td>
<td>Principal</td>
<td>FKT-AAA Principal, Seattle Fire Department Fire Prevention Division 220 Third Avenue South Floor 2, Seattle, WA 98104-2608</td>
<td>John Nelsen</td>
</tr>
<tr>
<td>Harold A. Locke</td>
<td>Principal</td>
<td>FKT-AAA Principal, Locke &amp; Locke Inc., 3552 West 2nd Avenue, Vancouver, BC V6R 1J4 Canada</td>
<td>Harold A. Locke</td>
</tr>
<tr>
<td>Kevin M. Lewis</td>
<td>Principal</td>
<td>FKT-AAA Principal, Bombardier Transportation, 1501 Lebanon Church Road, Pittsburgh, PA 15236-1491</td>
<td>Kevin M. Lewis</td>
</tr>
<tr>
<td>Stephanie H. Markos</td>
<td>Principal</td>
<td>FKT-AAA Principal, US Department of Transportation Volpe National Transportation Systems Center 55 Broadway, RTV-3D Cambridge, MA 02142</td>
<td>Stephanie H. Markos</td>
</tr>
<tr>
<td>Steven W. Roman</td>
<td>Principal</td>
<td>FKT-AAA Principal, LTK Engineering Services 100 West Butler Avenue, Ambler, PA 19002</td>
<td>Steven W. Roman</td>
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Note: The dates next to each name indicate the entry date for each individual's appointment.
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<td>Robert W. Falvey</td>
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<td>FKT-AAA</td>
<td>Lea &amp; Elliott, Inc. 7345 West Sand Lake Road, Suite 214 Orlando, FL 32819</td>
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<td>Daniel P. Finnegan</td>
<td>Alternate</td>
<td>FKT-AAA</td>
<td>Siemens Industry, Inc. Building Technologies Division Fire &amp; Security 2953 Exeter Court West Dundee, IL 60118-1724</td>
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<td>William E. Koffel</td>
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<td>Martha K. Gulick</td>
<td>Alternate</td>
<td>FKT-AAA</td>
<td>Port Authority of New York &amp; New Jersey One PATH Plaza, 6th Floor Jersey City, NJ 07306</td>
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<td>Harold L. Levitt</td>
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<td>Alternate</td>
<td>FKT-AAA</td>
<td>New York City Transit Authority 2 Broadway, Room D4.104 New York, NY 10004</td>
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<tr>
<td>Thomas P. O'Dwyer</td>
<td>Alternate</td>
<td>FKT-AAA</td>
<td>Parsons Brinckerhoff, Inc. One Penn Plaza New York, NY 10119</td>
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<td>Silas K. Li</td>
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<tr>
<td>Susan Reed Tanaka</td>
<td>Alternate</td>
<td>FKT-AAA</td>
<td>Toronto Transit Commission 5140 Yonge Street, 6th Floor Toronto, ON M2N 6L6 Canada</td>
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<td>Pierre Laurin</td>
</tr>
<tr>
<td>Paul Fok</td>
<td>Alternate</td>
<td>FKT-AAA</td>
<td>Land Transport Authority, Singapore No. 1 Hampshire Road Block 3 #04-00 Singapore, 219428 Singapore</td>
<td></td>
<td>Leong Kwok Weng</td>
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<tr>
<td>Ruth D. Hollingsworth</td>
<td>Alternate</td>
<td>FKT-AAA</td>
<td>LTK Engineering Services 100 West Butler Avenue Amber, PA 19002</td>
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<td>Neil E. Nott</td>
<td>Alternate</td>
<td>FKT-AAA</td>
<td>Washington Metropolitan Area Transit Authority (WMATA) 198 Van Buren Street, Suite 300 Herndon, VA 20170</td>
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<td>Joseph F. Krempasky</td>
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<td>James R. Quiter</td>
<td>Alternate</td>
<td>FKT-AAA</td>
<td>Arup 560 Mission Street, Floor 7 San Francisco, CA 94105</td>
<td></td>
<td>Jarrod Alston</td>
</tr>
<tr>
<td>William R. Segar</td>
<td>Alternate</td>
<td>FKT-AAA</td>
<td>Bombardier Transportation 1361 Foxwood Drive Monroeville, PA 15146</td>
<td></td>
<td>Kevin M. Lewis</td>
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<tr>
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</tbody>
</table>
| Dilip S. Shah        | Alternate         | AECOM Technical Services, Inc. 
Tunnel Ventilation Group 
2101 Webster Street, Suite 1000 
Oakland, CA 94612-3060 
Principal: Daniel M. McKinney |
| Joseph P. Streany    | Alternate         | Metro North Railroad 
347 Madison Avenue, 11th Floor 
New York, NY 10017-3739 
Metropolitan Transportation Authority 
Enforcer 
Principal: Lee M. Sorensen |
| Don Tangarone        | Alternate         | National Railroad Passenger Corporation (Amtrak) 
2955 Market Street, Drop Box 55 
Philadelphia, PA 19014 
Principal: Stephen B. Wilchek |
| Anthony Tedesco      | Alternate         | Fire Department City of New York 
9 MetroTech Center 
Brooklyn, NY 11201 
Principal: Kevin P. Harrison |
| Joshua Teo           | Alternate         | Bay Area Rapid Transit District (BART) 
300 Lakeside Drive, 18th Floor 
San Francisco, CA 94612 
Principal: Mark Chan |
| John Powell White    | Alternate         | IFT/Fire Cause Analysis 
935 Pardee Street 
Berkeley, CA 94710 
Principal: Joseph B. Zicherman |
| Arnold Dix           | Nonvoting Member  | School Medicine, UWS 
Lawyer/Scientist 
16 Sherman Court 
Berwick, VIC 3806 Australia |
| Frank J. Cihak       | Member Emeritus   | FJC Transit Consultants 
9010 Nomini Lane 
Alexandria, VA 22309-2811 |
| Norman H. Danziger   | Member Emeritus   | 11231 Golfridge Lane 
Boynton Beach, FL 33437 |
| Edward K. Farrelly   | Member Emeritus   | E. Farrelly & Associates 
60 Blanch Avenue 
Harrington Park, NJ 07640 |

Chad Duffy
Staff Liaison
National Fire Protection Association 
1 Batterymarch Park 
Quincy, MA 02169-7471