Technical Committee on NFPA 130, Fixed Guideway and Passenger Rail Transit Systems

Report on Comment Meeting Agenda (A2013)
October 14-17, 2012

Sheraton Suites San Diego @ Symphony Hall
701 A Street, San Diego, CA
619.846.9800

1:00 P.M. to 5:30 P.M. PST on Oct 14th
8:00 A.M. - 5:00 P.M. on October 15th – 17th

Sunday, October 14, 2012
The meeting room will be open and available from 10:00 AM -12:00 noon for task groups requiring meeting room space prior to the meeting.

Sunday, October 14, 2012:

1. Call to Order at 1:00 P.M. PST

2. Introduction of Members & Guests, Attendance

3. Chairman comments

4. NFPA Staff Liaison presentation & review of key dates within current cycle.

5. Approval of Previous Meeting Minutes A2013 ROP (see Attachment 1)

6. Act on Public Comments & Committee Comments for NFPA 130 (see Attachment #2)

7. Adjourn Meeting @ 5:30 P.M. PST
Monday, October 15, 2012:
8:00 A.M. - 5:00 P.M.

1. Call to Order – 8:00 A.M. PST
2. Act on Public Comments & Committee Comments for NFPA 130 morning session (see Attachment #2)
3. Lunch Break 12:00 PM – 1:00 PM
4. Act on Public Comments & Committee Comments for NFPA 130 afternoon session (see Attachment #2)
5. Adjourn Meeting @ 5:00 P.M. PST

Tuesday, October 16, 2012:
8:00 A.M. - 5:00 P.M.

1. Call to Order – 8:00 A.M. PST
2. Act on Public Comments & Committee Comments for NFPA 130 morning session (see Attachment #2)
3. Lunch Break 12:00 PM – 1:00 PM
4. Act on Public Comments & Committee Comments for NFPA 130 afternoon session (see Attachment #2)
5. Adjourn Meeting @ 5:00 P.M. PST
Wednesday, October 17, 2012:
8:00 A.M. - 5:00 P.M.

1. Call to Order – 8:00 A.M. PST
2. Act on Public Comments & Committee Comments for NFPA 130 morning session (see Attachment #2)
3. Lunch Break 12:00 PM – 1:00 PM
4. Act on Public Comments & Committee Comments for NFPA 130 afternoon session (see Attachment #2)
5. Adjourn Meeting @ 5:00 P.M. PST

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 committee comments at the meeting.
### Key Dates for the Annual 2013 Revision Cycle
(NFPA 130  2014 edition)

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposal Closing Date</td>
<td>November 25, 2011</td>
</tr>
<tr>
<td><strong>Final Date for ROP Meeting</strong></td>
<td>February 24, 2012</td>
</tr>
<tr>
<td>Final Date for Mailing TC Ballots</td>
<td>March 16, 2012</td>
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<tr>
<td><strong>Ballots Returned By</strong></td>
<td>April 20, 2012</td>
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<tr>
<td>ROP Published &amp; Posted</td>
<td>June 22, 2012</td>
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<tr>
<td>Comment Closing Date</td>
<td>August 31, 2012</td>
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<tr>
<td><strong>Final Date for ROC Meeting</strong></td>
<td>November 2, 2012</td>
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<tr>
<td>Final date for mailing TC ballots</td>
<td>November 16, 2012</td>
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<tr>
<td><strong>Ballots Returned By</strong></td>
<td>November 30, 2012</td>
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<tr>
<td>ROC Published &amp; Posted</td>
<td>February 22, 2013</td>
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<tr>
<td>Closing Date for Notice of Intent to Make a Motion (NITMAM)</td>
<td>April 5, 2013</td>
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<td><strong>Issuance of Consent Document (No NITMAMs)</strong></td>
<td>May 28, 2013</td>
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<tr>
<td>NFPA Annual Meeting</td>
<td>June 2013</td>
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<tr>
<td><strong>Issuance of Document with NITMAM</strong></td>
<td>August 1, 2013</td>
</tr>
</tbody>
</table>

Technical Committee deadlines are in **bold**.
Meeting Preparation

Committee members are strongly encouraged to review the comments prior to the meeting and to be prepared to act upon each item.

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

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

Materials to have at meeting:
- Current edition of the standard
- Meeting agenda
- Public Comments & associated attachments

Regulations and Guiding Documents

All committee members are expected to behave in accordance with the Guide for the Conduct of Participants in the NFPA Standards Directory (on-line).

All actions during and following the committee meetings will be governed in accordance with the NFPA Regulations Governing Committee Projects. 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 proposals 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.
Attachment #1:

*Previous Meeting Minutes*
MINUTES OF ROP MEETING

Day 1 - Sunday January 22, 2012

- Call to Order – 1:00 PM MST
- 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 Proposals for NFPA 130
- Adjourn by 5:00 PM MST

Day 2 - Monday January 23, 2012

- Call to Order – 8:00 AM MST
- Act on Public Proposals for NFPA 130
- Adjourn by 5:00 PM

Day 3 - Tuesday January 24, 2012

- Call to Order – 8:00 AM MST
- Act on Public Proposals for NFPA 130
- Generate Committee Proposals for NFPA 130
- Adjourn by 5:00 PM MST

Day 4 - Wednesday January 25, 2012

- Call to Order – 8:00 AM MST
- Act on Public Proposals for NFPA 130
- Generate Committee Proposals for NFPA 130
- Old business
- New business
- Future ROC Meeting discussion
- Adjourn by 5:00 PM MST

Day 1 - January 22, 2012

Meeting Called To Order:
Chairperson Harold Levitt called the meeting to order at 1:10 PM on January 22, 2012. Mr. Levitt outlined the main objective of the meeting and reviewed the agenda for the next few days; About 230 public proposals have been entered into the Report on Proposals.

Mr. Levitt presented the guidelines for serving on the committee. The Chair once again stated that there still remain a number of Principals/Organizations who have not named their Alternates and therefore in the absence of a Voting Alternate, should the Principal remain absent from meetings, that organization will lose its seat on the committee unless there is an approved alternate present.
Approval of ROC meeting on October 19-22, 2008 and Conference Call on October 27, 2008

Minutes of Meeting
The first order of business was to approve the October 19-22, 2008 ROC meeting and October 27, 2008 conference call meetings minutes, a motion to approve was so moved by the committee.

NFPA Staff Liaison Report
The committee’s staff liaison, Sandra Stanek went over the rules of order for the ROP 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 Proposals (identified as the 230 proposals entered as of November 24, 2011) must be acted upon at this session or a follow-up session that must be held prior to November 2, 2012, should the task of this committee not be completed by the time of adjournment Wednesday, January 25, 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 must vote. She then went into the ROC component of the process and stated that no new material could be introduced at that time. Anything new would have to be held over for the next edition.

<table>
<thead>
<tr>
<th>PROCESS STEPS – A2013 CYCLE</th>
<th>DATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposal Closing Date</td>
<td>11/24/2011</td>
</tr>
<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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<tr>
<td>Comment Closing</td>
<td>08/31/2012</td>
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<tr>
<td>ROC Meeting (San Diego or San Francisco, CA.)</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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<tr>
<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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</tbody>
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Introductions and Attendance:
The meeting attendance sheets are attached.

Explanation of NFPA Procedures:
This ROP session will be set-up as follows:
- All proposals contained in the ROP documents must be acted upon; Committee Proposals (CP) do not have to be acted upon;
- All task groups in order will present first, their formally entered proposals, and if there are simple Committee Proposals (CP), they will be allowed during each TG session.

Discussion of Next Meeting Location for the Cycle:
The final data for ROC meeting is November 2, 2012. The chairperson proposed the next committee meeting for ROC to be in San Francisco, Los Angeles, or San Diego from October 14-17, 2012. Chairperson Levitt encouraged feedbacks on meeting date and location; discussion will at the end of the ROP meeting.

Presentation on Cables:
Marcelo Hirschler presented on cable issues within NFPA 130 standard for approximately 10 minutes.
The presenter has requested that his presentation slides be attached to the meeting minutes, see ATTACHMENT 2.

**Task Groups and their Chairpersons:**

<table>
<thead>
<tr>
<th>TASK GROUP NO.</th>
<th>TASK GROUP NAME</th>
<th>TASK GROUP LEADER</th>
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</thead>
<tbody>
<tr>
<td>TG – 1</td>
<td>Man of Style – SI Conversion</td>
<td>Tom Middlebrook</td>
</tr>
<tr>
<td>TG – 2</td>
<td>Emergency Exiting</td>
<td>Katherine Fagerlund</td>
</tr>
<tr>
<td>TG – 3</td>
<td>Ventilation</td>
<td>Bill Kennedy</td>
</tr>
<tr>
<td>TG – 4</td>
<td>Vehicles</td>
<td>Steve Roman</td>
</tr>
<tr>
<td>TG – 5</td>
<td>Facilities - Fire Alarms &amp; Fire Suppression</td>
<td>Katherine Fagerlund</td>
</tr>
<tr>
<td>TG – 6</td>
<td>Emergency Procedures</td>
<td>John Nelsen</td>
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<tr>
<td>TG – 7</td>
<td>Control Systems Reliability</td>
<td>Jim Conrad</td>
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</tbody>
</table>

**NOTE:** Definition of a “Park” Proposal used by this TC – Indicates that there are issues with a specific proposal that must be resolved before an ROP/ROC meeting is adjourned. Before the TC can adjourn a follow-up MS Office Live Meeting (set up by NFPA) shall be established but only if more time is required to resolve any/all issues with a proposal. This meeting cannot go past the NFPA mandated ROP closing date of 2/24/2012 the A2013 Cycle.

**Task Group Presentations of Their Proposals:**

**Task Group 4 – Presented by Steve Roman:**
Steve presented 26 proposals.

**Task Group 3 - Presented by William Kennedy:**
Bill presented one (1) of his TG’s 32 proposals.

**Day 1 - Adjourned at 6:00 PM**

**Day 2 - January 23, 2008**

- Meeting called to order at **8:00 AM.**
- Finished Task Group 3 proposals.

**Task Group 3 - Presented by William Kennedy:**
Bill presented the remaining TG proposals.

**Task Group 6 – Presented by John Nelson:**
John presented his TG’s proposals.

**Task Group 1 – Presented by William Kennedy:**
In the absence of the TG 1 Chairperson Bill Kennedy acted on his behalf and presented 41 proposals.

**Task Group 5 – Presented by Katherine Fagerlund:**
Katherine presented her first five (5) proposals.
Task Group 7 – Presented by Jim Conrad:
Jim presented his first seven (7) proposals.

Day 2 - Adjourned at 5:45 PM

Day 3 - January 24, 2012

- Meeting called to order at 8:00 AM.

Task Group 7 – Presented by Jim Conrad:
Jim presented his remaining TG proposals.

Task Group 2 & 5 - Presented by Katherine Fagerlund:
Katherine presented her remaining TG2 proposals.

Day 3 - Adjourned at 6:35 PM

Day 4 - January 25, 2012

- Meeting called to order at 7:00 AM.

ROC Meeting Planning
Chair Levitt reviewed meeting logistics for the ROC. The TC discussed dates and four alternative locations. The meeting dates will be Sunday Oct 14 through Wednesday Oct 17, 2012. The four cities considered were Seattle, San Francisco, Los Angeles and San Diego.

The TC voted that San Diego was the preferred location with San Francisco being the alternate.

Task Group 2&5- Presented by Katherine Fagerlund:
Katherine presented her remaining proposals.

All Public and Committee Proposals were acted upon and seeing there was no Old or New Business to handle; at 3:22 PM, the Committee Chairperson called for a motion for adjournment, the motion passed.

Respectfully submitted,

Thomas Middlebrook
Technical Committee Secretary
<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>John Devlin</td>
<td>Aon Fire Protection Engineering</td>
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<tr>
<td>William Kennedy</td>
<td>Parsons Brinckerhoff</td>
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<tr>
<td>Harold Locke</td>
<td>Locke &amp; Locke Inc.</td>
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<tr>
<td>David Mao</td>
<td>U.S. Department of Transportation</td>
<td></td>
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<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>
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<tr>
<td>Thomas Middlebrook</td>
<td>MRC/MMM Group Limited</td>
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<tr>
<td>Robert Montfort</td>
<td>Metropolitan Transportation Authority</td>
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<tr>
<td>John Nelsen</td>
<td>Seattle Fire Department</td>
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<tr>
<td>James Quinter</td>
<td>Arup</td>
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<tr>
<td>Susan Reed Tanaka</td>
<td>Toronto Transit Commission</td>
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<tr>
<td>Steven Roman</td>
<td>LTK Engineering Services</td>
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<tr>
<td>Julian Sandu</td>
<td>Chicago Transit Authority</td>
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<tr>
<td>Michael Thomas</td>
<td>Los Angeles City Fire Department</td>
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<tr>
<td>Robert Till</td>
<td>John Jay College of Criminal Justice</td>
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<tr>
<td>Stephen Wilcheck</td>
<td>National Railroad Passenger Corporation</td>
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<td>Joseph Zicherman</td>
<td>IFT Fire Cause Analysis</td>
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<td>ALTERNATE</td>
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<td>Jarrod Alston</td>
<td>Arup</td>
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<td>Katherine Fagerlund</td>
<td>Sereca Fire Consulting Ltd.</td>
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<td>Robert Falvey</td>
<td>Lea &amp; Elliott, Inc.</td>
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<tr>
<td>Ritch Hollingsworth</td>
<td>LTK Engineering Services</td>
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<tr>
<td>Vincent Kwong</td>
<td>Bay Area Rapid Transit District (BART)</td>
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<td>Pierre Laurin</td>
<td>Toronto Transit Commission</td>
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<td>Silas Li</td>
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<td>James Conrad</td>
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<td>Gil Shoshani</td>
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<tr>
<td>Marcelo Hirschler</td>
<td>GBH Inst.</td>
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<td>David Plotkin</td>
<td>AECOM</td>
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<td>Matt Vahlsing</td>
<td>General Cable</td>
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<tr>
<td>Ana Ruiz, PhD</td>
<td>TD&amp;T LLC</td>
<td></td>
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<tr>
<td>John Buraczynski</td>
<td>PB</td>
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<tr>
<td>William Koffel</td>
<td>Koffel Associates Inc.</td>
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<tr>
<td>Ed Walton</td>
<td>DRAKA</td>
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<tr>
<td>Jim Natarfrarcesio</td>
<td>RSCC</td>
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<td>Peter Moran</td>
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<td>John White</td>
<td>Fire</td>
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<td>Steven White</td>
<td>Long Island Railroad</td>
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<tr>
<td>Joe McElvaney</td>
<td>City of Phoenix</td>
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<tr>
<td>NFPA STAFF</td>
<td></td>
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<tr>
<td>Sandra Stanek</td>
<td>NFPA Staff Liaison</td>
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<tr>
<td>Rich Bielen</td>
<td>NFPA</td>
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Attachment #2:

Public Comments
130-     Log #81  Final Action:
(Entire Document)

Submitter: Harold A. Locke, Locke & Locke Inc.
Comment on Proposal No:  130-115
Recommendation:  Revise text to read as follows:
1.1.1 This standard shall cover life safety from fire and fire protection requirements for underground, surface, and elevated fixed guideway transit and passenger rail systems, including but not limited to stations, trainways, emergency ventilation systems, vehicles, emergency procedures, communications, control systems, and vehicle storage areas.
3.3.12 Critical Velocity.  The minimum steady-state velocity of the ventilation airflow moving toward the fire within an enclosed trainway tunnel or passageway that is required to prevent backlayering at the fire site.
3.3.23 Guideway.  That portion of the fixed guideway transit or passenger rail line 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.
3.3.35 Point of Safety.  A point of safety is one of the following: (1) an enclosed fire-separated 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.
5.2.3.1.1* Stair and Escalator Enclosure.  Stairs and escalators used by passengers shall not be required to be enclosed fire-separated.
5.5.6.3.1.2* In computing the means of egress capacity available on platforms, corridors, and ramps, 300 mm (12 in.) shall be deducted at each sidewalk and 450 mm (18 in.) at open platform edges that are open to the trainway.
5.5.6.3.2.5 (3) For enclosed stations, at least one enclosed fire-separated exit stair or exit passageway shall provide continuous access from the platforms to the public way.
5.7.4.3 Where underground enclosed stations include more than one platform level (such as crossover subway lines), there shall be a cross-connection pipe of a minimum size of 100 mm (4 in.) in diameter between each standpipe system, so that supplying water through any fire department connection will furnish water throughout the entire system.
5.7.6.1* Underground Enclosed stations shall be provided with a fire command center in accordance with NFPA 72.
5.7.6.2 The ventilation systems at adjacent tunnels trainways and stations shall be permitted to be omitted from the controls of the fire command center.
6.2.2 Means of Egress Underground from Enclosed Trainways.
6.2.2.2.1 Within underground or enclosed trainways, the maximum distance between exits shall not exceed 762 m (2500 ft).
6.2.2.2.2 For exit stairs serving underground or enclosed trainways, the width of exit stairs shall not be required to exceed 1120 mm (44 in.).
6.2.2.3.1 Cross-passageways shall be permitted to be used in lieu of emergency exit stairways to the surface where trainways in tunnels are divided by a minimum of 2 hour -rated fire walls separations or where trainways are in twin bores.
6.2.2.3.2 Where cross-passageways are utilized in lieu of emergency exit stairways, the following shall apply:
(2)* Cross-passageways shall not be farther than 244 m (800 ft) from the station or tunnel portal of the enclosed trainway.
(4) Openings in open Cross-passageways shall be separated from the trainway protected with self-closing fire door assemblies having a fire protection rating of 1½ hours with a self-closing fire door.
(6) A ventilation system for the contaminated tunnel incident trainway shall be designed to control smoke in the vicinity of the passengers.
6.2.2.4.2 Doors in the means of egress shall comply with the following:
(2) Be adequate to withstand positive and negative pressures caused by passing trains and tunnel the emergency ventilation system.
6.2.5.1 The requirements of 6.2.5.2 through 6.2.5.3.2 shall apply to all underground or enclosed trainways that are greater than 30.5 m (100 ft) in length or 2 car lengths, whichever is greater.
6.2.7.1* Blue light stations shall be provided at the following locations:
(5) In underground enclosed trainways as approved
6.2.8.1* Under-ground or eClosed trainways greater in length than the minimum length of one train shall be provided with directional signs as appropriate for the emergency procedures developed for the fixed guideway transit or passenger rail system in accordance with Chapter 9.
6.2.8.2 Signs indicating station or portal directions shall be installed at maximum 25 m (82 ft) intervals on either side of...
the **underground** or enclosed trainways.

6.2.8.4 Points of exit from elevated and **underground** or enclosed trainways shall be marked with internally or externally illuminated signs.

6.3.1 **Underground** (Subways)**Enclosed Trainways**.

6.3.1.1 **Enclosed Trainways**.

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.

6.3.1.1.5.3 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.

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

6.3.2.2* Emergency ventilation meeting the tenability criteria for occupied areas shall not be required in storage track areas where the storage track **does not open has no openings** along its length to passenger **trainway 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.

6.3.3.1.2 Life safety and fire protection criteria for the subsystem installed in the trainway shall conform to the requirements for **underground** enclosed trainways that are listed in 6.4.2.

6.3.3.2 **Underground** (Subways)**Enclosed Trainways**.

6.5.2.1 An approved fire standpipe system shall be provided in **underground** enclosed fixed guideway transit or passenger rail system trainways where physical factors prevent or impede access to the water supply or fire apparatus, where required by the authority having jurisdiction.

6.5.2.4 Identification numbers and letters conforming to the **system** sectional identification numbers and letters of the fixed guideway transit or passenger **trainway system** shall be provided at each surface fire department connection and at each hose valve on the standpipe lines.

6.5.2.4.1 Identifying signs shall be affixed to **underground** or enclosed trainway walls at each hose outlet valve or shall be painted directly on the standpipe in white letters next to each hose outlet valve.

6.5.2.4.2 Exposed **tunnel** standpipe lines and identification signs shall be painted as required by the authority having jurisdiction.

6.5.3 **Standpipe Installations in Tunnels Under** – **Safeguards During Construction**.

6.5.3.1 A standpipe system shall be installed in **tunnels** enclosed trainways under construction in accordance with NFPA 241.

6.5.3.1.1 A standpipe system shall be installed before the **tunnel** enclosed trainway has exceeded a length of 61 m (200 ft) beyond any access shaft or portal and shall be extended as work progresses to within 61 m (200 ft) of the most remote portion of the **tunnel** enclosed trainway.

6.5.3.* Illumination level in **enclosed** trainways under construction shall not be less than 2.7 lx (0.25 ft-candles) at the walking surface.

6.5.4 **Portable Fire Extinguishers**. Portable fire extinguishers shall be provided in such numbers, sizes, and types and at such locations in **tunnels** enclosed guideways as determined by the authority having jurisdiction.

6.6.2 **Vehicle Roadway Terminations**. Vent or fan shafts utilized for ventilation of **tunnels** enclosed trainways shall not terminate at grade on any vehicle roadway.

7.1.2.1 For length determination, all contiguous enclosed trainway and **underground** system station segments between portals shall be included.

7.1.2.2 A mechanical emergency ventilation system shall be provided in the following locations:

1. Where supported by engineering analysis, a nonmechanical emergency ventilation system shall be permitted to be provided in lieu of a mechanical emergency ventilation system in the following locations:

1. Where the length of the **underground** or enclosed trainway is less than or equal to 305 m (1000 ft) and greater than 61 m (200 ft).

7.2.2 Point-extract ventilation systems shall be permitted subject to an engineering analysis that demonstrates the system will confine the spread of smoke in the **tunnel** enclosed trainway to a length of 150 m (500 ft) or less.

7.2.6* The time-of-tenability criteria for stations and **tunnel** trainways shall be established and approved. For stations, the time shall be greater than the calculated egress time used to establish egress capacity in 5.5.6.

7.3.1 The ventilation system fans that are designated for use in fire emergencies shall be capable of satisfying the emergency ventilation requirements to move **tunnel** trainway air in either direction as required to provide the needed ventilation response.

7.7.9 For electrical substations and distribution rooms serving emergency ventilation systems where the local
environmental conditions require the use of mechanical ventilation or cooling to maintain the space temperature below the electrical equipment operating limits, such mechanical ventilation or cooling systems shall be designed so that failure of any single air moving or cooling unit does not result in the loss of the electrical supply to the tunnel emergency ventilation fans during the specified period of operation.

8.5.1.2.2 Vehicles that travel through tunnels enclosed trainways and have a roof that is constructed of a combustible material shall require a fire hazard analysis to demonstrate that rapid fire spread to passenger and crew compartments or local roof collapse is not possible during the exposure period.

8.6.1 General Construction. All motors, motor control, current collectors, and auxiliaries shall be of a type and construction suitable for use on fixed guideway transit and passenger rail system vehicles.

8.11.1* General. The requirements of this section shall apply to fixed guideway and passenger rail system vehicles designed to meet the engineering analysis option permitted by Section 8.2 and to meet the goals and objectives stated in Sections 4.2 and 4.3.

9.3 Emergencies. The emergency management plan shall address the following types of emergencies:

(7) Flooding from internal or external sources

9.4* Emergency Procedures. An emergency procedure shall be developed to address specifically the various types of emergencies that might be experienced on the system and shall include, but not be limited to, the following:

(8) Fire and smoke emergency information and procedures to be provided, including the following:

(b) Location of train in tunnel enclosed trainway and fire location on train

A.6.2.2 Some previous editions of NFPA 130 addressed this requirement by prescribing the maximum travel distance to an exit. The intent of this requirement was often misinterpreted. NFPA 101 requires, at a minimum, that two means of egress be provided within a building or structure and specifies the maximum travel distance to an exit. This same requirement is applied in NFPA 130. Where two means of egress are required, the maximum travel distance to an exit occurs at the midpoint. For example, in a building with two exits, in the event of a fire adjacent to an exit rendering that exit unavailable, NFPA 101 recognizes that an individual in proximity to the affected exit must travel twice the prescribed exit travel distance to the alternate exit. Since two means of egress are required at from any one point in a tunnel enclosed guideway, the exits cannot be more than twice the travel distance, or 762 m (2500 ft) apart.

A.7.1.1 Separate ventilation systems for tunnels and underground enclosed trainways and 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.

A.8.4 Tunnel enclosed trainways more than 610 m (2000 ft) in length should be equipped with emergency tunnel evacuation carts (ETECs) at locations to be determined by the authority having jurisdiction. ETECs should be capable of carrying a capacity of at least four stretchers and a total weight capacity of at least 453.5 kg (1000 lb). ETECs should be constructed of corrosion-resistant materials, be equipped with a "deadman" brake, and safely operate on the rail tracks in the tunnel enclosed trainway.

B.1 General. ... Current technology is capable of analyzing and evaluating all unique conditions of each property to provide proper ventilation for normal operating conditions and for pre-identified emergency conditions. The same ventilating devices might or might not serve both normal operating conditions and pre-identified emergency requirements. The goals of the subway emergency ventilation system for an enclosed trainway, in addition to addressing fire and smoke emergencies, are to assist in the containment and purging of hazardous gases and aerosols such as those that could result from a chemical/biological release.

B.3 Configurations. ... Enclosed stations and trainways might be configured with the following characteristics:

(1) High or low ceilings
(2) Open or doored entrances
(3) Open or screened platform edges
(4) End-of-station or mid-tunnel fan shafts
(5) End-of-station or mid-tunnel vent shafts
(6) Single, double, or varying combinations of tracks in tunnels
(7) Intersecting tunnels enclosed trainways
(8) Multilevel stations
(9) Multilevel tunnels enclosed trainways
(10) Varying depths below the surface
(11) Varying grades and curvatures of tracks and tunnels enclosed trainways
(12) Varying blockage ratios of vehicles to tunnel enclosed trainway cross-section
(13) Varying surface ambient conditions
(14) Varying exit points to surface or points of safety
B.4.2 Draft control can be achieved by the placement of shafts along the tunnel length of the enclosed trainway between stations. Shafts can be arranged with the fan shafts at the ends of stations, with vent shafts mid-tunnel if required or with vent shafts at the ends of stations and fan shafts mid-tunnel. End-of-station shaft configurations should be related to the station geometries in the consideration of patron comfort in the station relative to train piston draft effects.

B.5.2 Temperature control and ventilation for ancillary areas housing special equipment should reflect the optimum operating conditions for the specific equipment to ensure the availability of critical equipment and should also give consideration for intermittent occupancy by maintenance personnel. These systems should be separate from the emergency ventilation system for stations and tunnels. enclosed trainways and should be considered in the design of the emergency ventilation system.

B.7.1 The inclusion of platform edge screens is a design option that is effective for comfort control in stations as well as for smoke control in tunnels. enclosed trainways. When used, the screens should meet both fire resistivity and structural strengths relative to the train and ventilation system drafts and the operational efficiency requirements.

B.7.2 In a tunnel trainway-to-station evacuation scenario, access to the platform level from the trainway should be considered.

B.8 Nonfire Tunnel Ventilation for Enclosed Trainways.

Where trains might be stopped or delayed in an enclosed trainway for a period of time, the vehicle ventilation system should be capable of maintaining an acceptable level of patron comfort. If not operating in a fire emergency scenario, the tunnel emergency ventilation fans can be used to augment the vehicle system capability. Velocities should consider the comfort levels of employees required to be in the tunnels enclosed trainways.

C.1.2 Calculating Evacuation Time. The total evacuation time is the sum of the walking travel time for the longest exit route plus the waiting times at the various circulation elements. The tunnel trainway can be considered as an auxiliary exit from the station under certain fire scenarios.

C.1.4 Side-Platform Station Sample Calculation. The sample side-platform station is a subway an enclosed station with a concourse above the platform level but below grade. (See Figure C.1.4.) The platform is 183 m (600 ft) long to accommodate the train length. The vertical distance from grade to concourse is 8 m (26 ft). The concourse is 5.5 m (18 ft) above the platform.

D.1 Introduction. This annex provides additional information on the hazards associated with burning vehicles and the impact of a burning vehicle on the evacuation of passengers and crew to a point of safety. Emergency evacuation from a vehicle containing a fire could include exiting a vehicle containing the fire to an adjacent vehicle, exiting the train into the operating environment (station, tunnel trainway, etc.) where the train is located, and moving through the operating environment to the point of safety. Chapter 8 contains minimum prescriptive requirements that are intended to provide sufficient time for passengers and crew to safely evacuate from a train containing a fire. This annex provides guidance for designing and evaluating train fire performance. A fire involving a train will have an impact on the conditions in the operating environment, and this type of fire is often used to design emergency systems in operating environments. Chapters 5 through 7 provide requirements on design of the operating environment to ensure that passengers can safely egress to a point of safety.

D.4 Vehicle Fire Heat Release Rate History. The heat release rate history of a vehicle fire should include the heat release rate during all stages of the fire. Fires inside of vehicles that are allowed to grow sufficiently large can reach flashover, where all of the items inside of the vehicle ignite. The largest heat release rates are expected after flashover occurs (i.e., post-flashover). The heat release rate during post-flashover is particularly important since many tunnel enclosed trainway and station smoke control system designs are based on the maximum expected heat release rate.

The heat release rate of the vehicle fire will also affect the heat that passengers could be exposed to during evacuation. The magnitude of the heat release rate during post-flashover will be a function of the amount of air drawn into the vehicle, the material fire properties, and the potential heat release rate of the burning fuels inside of the vehicle.

D.4.3 The heat release rate of the train fire will also affect the amount of heat the passengers are exposed to during the evacuation. Larger heat release rate fires will produce longer flames that could extend out of the vehicle openings. If the vehicle is inside a tunnel enclosed trainway, these flames could impinge on the ceiling and extend down away from the burning vehicle. Radiation from these flames to nearby evacuating passengers could be significant.

E.3.3 Step 3: Evaluate Specific Vehicle Fire Scenarios. The location of the train must be also considered in the analysis. For example, the fire risk to occupants is greater if the train is located between stations or within a tunnel enclosed trainway.

Substantiation: Regardless of the Committee Statement to proposal 130-115 Log #225 in the ROP, this proposal has validity in that it addresses a concern that has been raised in several recent cycles; therefore, the above revisions are offered for consideration.
Submitter: Stephanie H. Markos, US Department of Transportation

Recommendation: NFPA 101 reverted back to non-SI (inch-pounds) units being listed first and then SI units in parentheses in 2006 per a later than 2003 NFPA edition of Manual of Style and later editions. Accordingly, for consistency with the later NFPA Manual of Style, as reflected in NFPA 101, all sections of NFPA 130 for the 2014 edition should therefore revert back to non-SI units being listed first, followed by SI units in ( ), to be consistent with NFPA policy. This revision, if made, should also be noted in the Origin and Development section of the 2014 edition of NFPA 130: i.e., The units of measurement have been updated in accordance with the Manual of Style for NFPA Technical Committee Documents.

Substantiation: NFPA 130 is not consistent with later versions of NFPA Manual of Style which reverts back to listing non-SI units first and then SI units.

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Substantiation: NFPA 130 is not consistent with later versions of NFPA Manual of Style which reverts back to listing non-SI units first and then SI units.

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Submitter: Robert Montfort, New York City Transit Authority

Recommendation: The proposal was rejected by the Committee with a Committee Statement that the NFPA staff will incorporate the proposed wording. Markos note on the affirmative to the rejection indicated that NFPA 101 has documented units just the opposite from what the NFPA 130 committee has done. This needs to be clarified by NFPA staff as to what is the correct “manual of style”. If Markos is correct then the entire document needs to be updated.

Substantiation: Need to make sure all NFPA standards are following the same manual of style with regards to unit identifications in the two math systems and update the documents as necessary.

This is not original material; its reference/source is as follows:
See Comment on Affirmative from ROP 130-2.
130- Log #111
(1.1.2, 3.3.31, and 5.1.1.2)

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-5
Recommendation: Revise as follows:
1) Agree that this text in these sections needs to be revised as noted by the other commenters to the proposal to “get” the proper language.  2) In addition, word “transit” in section 3.3.31 should either be deleted or text revised to say add words to read: fixed guideway transit and passenger rail system
Substantiation: 1) See voting comments on proposal.  2) use of only the word “transit” is incorrect per usage as agreed in previous cycles to be clarify and be more inclusive.

130- Log #55
(1.3.4)

Submitter: Robert Montfort, New York City Transit Authority
Comment on Proposal No: 130-6
Recommendation: Action on proposal should be revised to include a Committee Statement as follows: “The substantiation for the proposal does not coordinate with the proposed change. The committee accepts this proposed change because it provides clarity as to intent of the section.”
Substantiation: The substantiation for the proposal is not related to the proposal and it should be made clear as to why the committee accepted the proposal by adding a committee statement.

130- Log #42
(2.2)

Submitter: Marcelo M. Hirschler, GBH International
Comment on Proposal No: 130-8
Recommendation: Reject proposal and do not add reference to NFPA 80.
Substantiation: NFPA 80 is not referenced in NFPA 130.
Report on Comments – June 2013

130- Log #52
(2.3.5)

Submitter: Marcelo M. Hirschler, GBH International
Comment on Proposal No: 130-12
Recommendation: Revise text to read as follows:
2.3.5 ASTM Publications. American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.
Substantiation: Standards Update – The new edition of ASTM E2652 is being added, since ASTM E2652 is now included based on the acceptance of Proposal 130-28.

130- Log #28
(2.3.9)

Submitter: John F. Bender, UL LLC
Comment on Proposal No: 130-13
Recommendation: Revise text as follows:
2.3.9 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.
Substantiation: Update referenced standard to most recent edition.
In other than open stations, 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 12.3.3.1 or 12.3.3.2.

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.

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 12.3.3.1.

In open stations, all wires and cables used shall be listed as resistant to flame spread by complying with the requirements of the VW-1 (vertical wire) flame test in ANSI/UL 1581-2001(Rev. 2011). Reference Standard for Electrical Wires, Cables and Flexible Cords. Substantiation: It is a reasonable consideration that wires and cables in open stations need not be required to comply with the same fire safety requirements as wires and cables in enclosed stations. However, it is not reasonable that those wires and cables meet no fire safety requirement. The level of fire safety associated with the UL VW-1 test is the minimum level of fire safety that the National Electrical Code (NEC) recognizes. In fact, cables that comply with nothing more than the VW-1 test are designated X-rated cables in the NEC (see articles 725, 760, 770, 800, 820, 830). The wording of “resistant to flame spread” as relates to VW-1 cables originates in the NEC also.

Experience indicates that wires and cables (especially since they are usually concealed) can generate a significant level of flame spread and/or of heat release if they are not required to have some minimal fire performance.

The VW-1 fire test is not new to users of NFPA 130 as it is the minimum fire test required for cables in ANSI/UL 44 for thermosetting insulation and ANSI/UL 83 for thermoplastic insulation. The VW-1 fire test is a significant step down in fire safety from the FT4/IEEE 1202 fire test and does not contain smoke obscuration requirements. Therefore, this comment is consistent with the committee’s wishes, as it expressed by accepting proposal 130-51 in principle.
All wires and cables used in enclosed stations shall be listed as being resistant to the spread of fire and shall have reduced smoke emissions, by complying with 5.4.5.1 or 5.4.5.2.

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.

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 5.4.5.1.

In open stations, all wires and cables used shall be listed as resistant to flame spread by complying with the requirements of the VW-1 (vertical wire) flame test in ANSI/UL 1581-2001 (Rev. 2011), Reference Standard for Electrical Wires, Cables and Flexible Cords.

It is a reasonable consideration that wires and cables in open stations need not be required to comply with the same fire safety requirements as wires and cables in enclosed stations. However, it is not reasonable that those wires and cables meet no fire safety requirement. The level of fire safety associated with the UL VW-1 test is the minimum level of fire safety that the National Electrical Code (NEC) recognizes. In fact, cables that comply with nothing more than the VW-1 test are designated X-rated cables in the NEC (see articles 725, 760, 770, 800, 820, 830). The wording of “resistant to flame spread” as relates to VW-1 cables originates in the NEC also.

Experience indicates that wires and cables (especially since they are usually concealed) can generate a significant level of flame spread and/or of heat release if they are not required to have some minimal fire performance.

The VW-1 fire test is not new to users of NFPA 130 as it is the minimum fire test required for cables in ANSI/UL 44 for thermosetting insulation and ANSI/UL 83 for thermoplastic insulation. The VW-1 fire test is a significant step down in fire safety from the FT4/IEEE 1202 fire test and does not contain smoke obscuration requirements. Therefore, this comment is consistent with the committee’s wishes, as it expressed by accepting the proposal in principle.

In view of the reorganization represented by the action on proposal 130-209, this section is slated to disappear and to be incorporated into a new chapter 12. A comment with the identical proposed language is being submitted to proposal 130-209, but this comment is being submitted in case the action on 130-209 is not successful, while the action on 130-51 is.

Under this proposal, the reference to NFPA 271 is being eliminated from paragraph 3.3.26.1 because it is inactive and being withdrawn. Recommend references to NFPA 271 in other portions of the standard such as 2.4 and G.1.1 also be eliminated.

Since NFPA 271 is inactive and being withdrawn, all references to it must be removed from the standard. This proposal makes reference only to paragraph 3.3.26.1 but NFPA 271 is also referenced in paragraphs 2.4 and G.1.1. This may be an editorial that the NFPA staff may automatically handle but it needs to be clarified if this is so.
Report on Comments – June 2013

130-     Log #1
(Chapter 3)

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.

3.3.1 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.

3.3.1.1 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.

3.3.1.1.1 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.

3.3.2 In-Building Mass Notification System. A system used to provide information and instructions to people in a building(s) or other space using intelligible voice communications and including visible signals, text, graphics, tactile, or other communication methods. (SIG-ECS)

3.3.2 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.

3.3.3 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:
Stephanie H. Markos, US Department of Transportation

130-16

The proposal appeared as Comment #10 for the 2009 ROC. I called the attention of the Committee to the very inconsistent use in the terms "fire engineering analysis" and "engineering analysis" during previous cycles. However, the point is the terms are used interchangeably but they DO have different meanings. There are more knowledgeable NFPA 130 Committee members who could/should review the different usages and assist in clarifying which terms are correct in the various sections. As also noted, is the issue that some usage of the terms have lists and some don't. In addition, several more sections than the ones listed, e.g., 5.5.6.2.3 and 5.12, and other sections which use the term, should be reviewed for the same type of clarification or other revision for consistency. Accordingly, this proposal should not have been rejected, but at least been held or accepted in principle, the same way that other proposals were accepted "with statement the text will be developed for ROC." Accordingly, committee members should meaningfully address the specifically identified cases of the inconsistent use and all other sections which use the terms to ensure that the proper usage is correct. The Negative Vote by Mr. Locke for this proposal contains proposed revisions for Committee action, which he has indicated to me that he is submitting as a Comment.

Substantiation: This proposal should not have been rejected, but at least been "held" or "accepted in principle", the same way that other proposals were accepted, with the statement the “Text will be developed by Technical Committee for ROC meeting.” Accordingly, committee members should meaningfully address the specifically identified cases of the inconsistent use and all other sections which use the terms to ensure that the proper usage is correct. The Negative Vote by Mr. Locke for this proposal provides a meaningful starting point for discussion.

130-17

The Committee should take action to review and prepare the necessary revisions to complete the text and address the conflicts at the ROC meeting.

Substantiation: The Committee did not take action to review, discuss, and prepare the necessary revisions to complete the text and address the conflicts at the ROP meeting.
An engineering analysis is a broad term that encompasses a range of different objectives and performance criteria. The complexity of the analysis and the factors requiring consideration are situation dependent and require the user to have sufficient understanding of the objectives, assumptions, and analysis tools being implemented.

General examples from within this document include analysis intended to provide justification for the modification of evacuation time/travel distance requirements, analysis to support the use of a concourse area as a point of safety, and analysis relative to the use of a non-mechanical ventilation system in lieu of a mechanical emergency ventilation system.

A written report of the analysis should be submitted to the authority having jurisdiction, indicating recommended fire protection method(s) that will provide a level of fire safety commensurate with this standard. The objectives, assumptions, sources of data, and degree of conservatism incorporated in the analysis should be addressed.

The term fire hazard analysis generally refers to analyses that are performed relative to the specific fire performance of materials, components, and assemblies for the purposes of addressing the subsequent contribution to the overall fire hazard and the resulting impact on occupant fire safety. A fire hazard analysis can provide an estimate of the potential severity of fires that can develop under defined fire scenarios. This analysis can encompass consideration of factors including but not limited to: quantities of materials, vulnerability of materials and components to ignition, propensity for flame spread, and smoke generation.

The formulation of a fire hazard analysis is subjective and is dependent upon the expertise of the user. The material provided in ANNEX E, although specifically addressing fire hazard analysis for vehicles, provides additional guidance relative to the steps that may be involved in a fire hazard analysis.

A written report of the analysis should be submitted to the authority having jurisdiction, indicating that a level of fire safety commensurate with this standard will be achieved.

5.2.2 Construction.

5.2.2.1 Building construction for all new enclosed stations shall be not less than Type I or Type II or combinations of Type I and Type II noncombustible construction as defined in NFPA 220, in accordance with the requirements of NFPA 101, Chapter 12, for the station configuration or as determined by an engineering fire hazard analysis of potential fire exposure hazards to the structure.

6.2.4* Combustible Components.

6.2.4.1 Where combustible components not specifically addressed in this standard are installed in a trainway, a fire hazard analysis shall be conducted to determine that the level of occupant fire safety is not adversely affected by the contents.

A.6.2.4 The fire hazard analysis should determine that the fire does not propagate beyond the area of fire origin, and that a level of fire safety is provided within the trainway commensurate with this standard. Computer modeling, material fire testing, or full-scale fire testing should be conducted, as appropriate, to assess fire performance in potential fire scenarios.

6.2.4.1 General. Combustible components not covered in Sections 6.3.1 through 6.3.3.2.8 shall comply with Section 6.2.4.

6.2.4.2 Engineering Fire Hazard Analysis.

6.2.4.2 A fire hazard analysis required by Section 6.2.4.1 shall be conducted on nonstructural combustible components that

(1) includes, as a minimum, an examination of peak heat release rate for combustible elements, total heat released, ignition temperatures, radiant heating view factors, and behavior of the component during internal or external fire scenarios

(2) to determine that, if a fire propagates beyond involving the component of fire origin, a level of fire safety is provided
within an enclosed trainway commensurate with this standard.

6.2.4.3 Computer modeling, material fire testing, or full-scale fire testing shall be conducted to assess durability performance in potential fire scenarios.

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 fire hazard 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 fire hazard analysis of potential fire exposure hazards to the structure.

7.3.2.1 An engineering design analysis shall be permitted to be used to reduce this temperature; however, the temperature shall not be less than 150°C (302°F).

8.2* Compliance Options. Passenger-carrying vehicles shall be designed to meet the prescriptive requirements of Section 8.3 through Section 8.10 or the engineering analysis requirements of Section 8.11.

A.8.2 - Annex E provides guidance relative to vehicle fire hazard assessments referenced within the requirements of Section 8.3 through Section 8.10.

8.11.2* Basis for Engineering Analysis.

A.8.11.2 Section 4.3 includes specific objectives necessary to achieve desired goals. Annex E contains additional guidance for conducting an engineering analysis. Further guidance relative to the engineering analysis option for compliance could include explanatory material regarding performance-based compliance in other documents such as NFPA 101.

Substantiation: Regardless of the Committee Statement to proposal 130-16 Log #1 in the ROP, this item carried forward from the A2009 ROC (130-21) to this cycle for action and has validity in that it addresses a concern that has been raised in several recent cycles; therefore, the above revisions are offered for consideration.
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 soot emitted per lb of fuel burnt).

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

3.3.20 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.

3.3.23 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.

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

3.3.21 Fire Soot Release Rate. (FSORR) Rate of soot release for a given fire scenario expressed as a function of time (units: m²/s or ft²/s).

3.3.20 Fire Smoke Release Rate. (FSMRR). Rate of smoke release for a given fire scenario expressed as a function of time (units: m²/sec or ft²/sec).

3.3.26.2 Fire Heat Release Rate for Ventilation Calculations (FHRR). Rate of energy release for a given fire scenario expressed as a function of time (units: W or Btu/s).

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 causes 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, FHRR, 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 rupture of a fuel line. This shall be in addition to Sections 7.2.3.1.1 and 7.2.3.1.2.

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:
(a) Electrical
(b) Mechanical
(c) Supervisory control

In Annex A, After Section 7.2.6, add:

A7.2.3.1
Annex D presents information concerning rail vehicle fires.
Annex E presents an approach to fire hazard analysis.
Annex H presents background and approaches to the development of fire profiles.

Add the below after Annex G

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 as 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 spreadsheet 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 soot 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 FCORRs 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 Adaptco
(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.
(12) PATH PA-4 Train Heat Release Rate History Design Fire for the World trade Center Permanent PATH Terminal, 24 April 2009, Documents Fire and Smoke Release Rates for PATH PA-4 Cars.
(14) Technical Memorandum – Fire Scenarios Report, Predicting the Fire and Smoke Release Rates of Rail Cars. 7
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.

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**130- Log #114**

(3.3.4 Blue Light Station and A.3.3.4)

**Final Action:**

**Submitter:** Stephanie H. Markos, US Department of Transportation  
**Comment on Proposal No:** 130-20  
**Recommendation:** Do not delete by retain the phrase text: “emergency service or authorized personnel”  
**Substantiation:** The proposed annex note deletes the emergency service or and authorized personnel as "examples" of "person" which make the proposal applicability too vague! Is this devise meant to be used by passengers / general public?

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**130- Log #167**  
(3.3.6, 5.5.6.3.4, A.3.3.6, and A.5.5.6.3.4)

**Final Action:**

**Submitter:** Stephanie H. Markos, US Department of Transportation  
**Comment on Proposal No:** 130-21  
**Recommendation:** Delete proposed text or revise the text to meaningfully address the design, operation, and maintenance (the last by adding an Annex note) by the 3 Negative voters for this proposal.  
**Substantiation:** Agree with Mr. Cassleman’s and Mr. Giblin’s Negative vote comments for the proposal. And as noted, in my vote comments, there are maintenance issues which must also be addressed. For example, the Boston MBTA Red Line subway system had “butterfly doors” for station exit doors on the street level when one station (Porter) on the Red Line was built. After several years, the doors were removed since most became stuck either in the open or closed position and did not pivot. Do not agree with Mr. Montfort’s Affirmative vote comment.  
This is not original material; its reference/source is as follows:  
Mr. Casselman and Mr. Giblin Negative Votes for Proposal 20.
A single two-leaf panel that pivots vertically on a central axis so that one leaf moves inward and the other moves outward.

The pivoting door movement on the vertical axis helps to equalize the air pressure on both sides of the door, considerably reducing the strength required to push open the door, especially when an emergency ventilation scenario is in effect.

Butterfly doors (Figure 1) should be permitted in means of egress for stations as follows:

- Door panels must be at a 9° angle when closed,
- The minimum clear width on either side of the pivot point with the door in the open position must be 760 mm;
- A permanent marking indicating the opening side must be applied, and
- The egress capacity for this type of door should be calculated as 120 ppm (2 × 60 ppm).

The use of butterfly doors would violate a fundamental principle of egress: that is, the requirement that doors swing in the direction of egress travel. In the case of the proposed butterfly doors, the left half (760 mm) of the door panel would swing against the direction of egress travel. If the door is unable to swing against the flow of egress travel for any reason, such as passengers pushing on the left panel or both panels simultaneously in an emergency egress scenario, then both halves of the door (1520 mm) would be impassable.

This proposal is at least the fourth time that butterfly doors have been proposed to the Committee since the mid 1990’s. All earlier proposals were rejected. In this proposal no new information has been submitted, other than the statement that the door has been proven over the years to be safe and reliable. It is presumed that this statement refers to the function of the doors in normal use since no observations of the doors in an actual emergency use scenario have been reported. Safe and reliable function under normal use is not an indicator of performance under emergency egress scenarios when panic, reduced visibility and disorientation are factors.

In prior review cycles, solutions to make the butterfly doors acceptable have been proposed by the Committee. For example, the doors could be designed to collapse into a book fold position similar to revolving doors used in egress. Alternatively, a railing could be placed in front of the left half of the door to prevent any possible blockage of the inward movement, of course that would allow use of only the right half of the door width as egress. These solutions have not been included in this proposal.

Finally, the reason used to justify the addition of butterfly doors to the Standard is the equalization of air pressure on both sides of the door making the door easier to use during an emergency ventilation scenario. It should be noted that there are other solutions to address the equalization of air pressures that do not introduce an egress risk, such as properly designed intake and exhaust vents and relief vents for the piston effect.

There is simply no need to introduce a provision in the Standard that violates a basic principle of egress, by allowing a door that swings against the flow of egress travel, when other solutions are available.
A single two-leaf panel that pivots vertically on a central axis so that one leaf moves inward and the other moves outward.

The pivoting door movement on the vertical axis helps to equalize the air pressure on both sides of the door, considerably reducing the strength required to push open the door, especially when an emergency ventilation scenario is in effect.

Butterfly doors (Figure 1) should be permitted in means of egress for stations as follows:

1. Door panels must be at a 9° angle when closed,
2. The minimum clear width on either side of the pivot point with the door in the open position must be 760 mm,
3. A permanent marking indicating the opening side must be applied, and
4. The egress capacity for this type of door should be calculated as 120 ppm ($2 \times 60$ ppm).

Figure 1 – The Butterfly Door

The addition of butterfly doors to the standard is not recommended for the reasons delineated below.

Much of the substantiation support for adding butterfly doors appears to come from research conducted by the National Research Council of Canada (NRCC), which tested the butterfly door and issued a report titled “Assessment of the butterfly door as a means of egress”, by Guylène Proulx and Darlene Higgins, Internal Report No. 748, issued in September 1997. Observations of people using butterfly doors during normal daily use would be significantly different from a real-world emergency egress scenario where there would exist the potential of a mass of closely-spaced people hurriedly arriving at the butterfly doors and simultaneously pushing on the right (outward) and left (inward) butterfly door leaves, possibly in the context of panic, fear, and confusion, along with smoke, power outage (and diminished lighting levels). In this type of scenario, people pushing on the left (inward) butterfly door leaf might not realize their mistake, and even if they did, they could potentially be prevented from backing up due to other people behind them crowding up right behind them and pushing as well, resulting in even greater panic and confusion. The simple diagram below illustrates this scenario:

*****Insert Figure #1 Here*****

Although there are some applications of butterfly doors in Canada, butterfly doors are extremely rare in other locations. Because of this the general public lacks familiarity with them. By contrast, people everywhere are very familiar with conventional doors, which are commonly used as a means of egress. In a real-world emergency egress scenario where there would exist the potential of a mass of closely-spaced people hurriedly arriving at the conventional doors and simultaneously pushing on the right (outward) and left (outward) conventional door leaves, possibly in the context of panic, fear, and confusion, along with smoke, power outage (and diminished lighting levels), both door leaves would operate independently of each other and open without the potential scenario described above for the butterfly doors. The simple diagram below illustrates this scenario:

*****Insert Figure #2 Here*****

Based on these concerns, it is recommended that the proposed modifications be deleted.
Means of Egress: **Butterfly Door**

If $F_A - F_B$, then these forces acting on the door result in equal opposing moments about the pivot point $O$. Expressed mathematically:

$$M_0 = F \times d$$

Where $M_0 = \text{Moment about Point O}$

$F_A = \text{Force applied at Point A}$

$F_B = \text{Force applied at Point B}$

$d = \text{Moment Arm}$

If $F_A = F_B$ and Moment Arms are equal length,

$$\sum M_0 = (F_A \times d) + (F_B \times d)$$

$$\sum M_0 = (\pm M_0) + (\pm M_0) = 0.$$ 

Meaning that the opposing forces acting on the butterfly door from people pushing on both the left (*inward*) and right (*outward*) door leafs would result in the door not moving and the inability of people to egress.
Regardless whether or not $F_A = F_B$, these forces acting on the door result in Moments about different pivot points. This means that the forces acting on the conventional door from people pushing on both the left (outward) and right (outward) door leaves would be independent of each other and would result in both doors opening independently and the ability of people to egress.

**Means of Egress: Conventional Doors**
Discuss and revise text of the sections to clarify as noted by Mr. Martineau and Mr. Montfort in their Affirmative vote comments. The proposed text by Mr. Martineau and Mr. Montfort in their Affirmative Votes for Proposal 22 should be reviewed, discussed, and if agreed by the Committee, both of their proposed text revisions be accepted in their entirety or if necessary, modified, and then agreed to by the Committee at the ROC meeting.

Add the word “fixed guideway” before “transit” to clarify that what type of transit is being referred to.

Add the word “fixed guideway” before “transit” to clarify that what type of “transit” is being referred to to agree with usage in other sections.

I supported the rejection of this proposal in that the term “local control” as defined in the proposal does not really clarify the meaning. In addition, the definition contained within Locke’s negative does not accomplish this. Therefore, if the committee wants to address this issue in this cycle, recommend the following text:

3.3.28* Local Control. The point of control of a mechanical, electrical, etc. system and/or subsystem that from a control perspective is the closest to the system and/or subsystem and from where full control of the system and/or subsystem can be achieved control of the emergency ventilation system or ventilation plant that is remote from the operations control center.

A.3.3.28 An example of a subsystem local control would be the starter panel for a pump within a mechanical space where local control can be taken to start the pump manually. An example of a local control of a mechanical system would be the control room for an emergency ventilation system located on the end of station. From this control room the entire emergency ventilation system can be operated and there is no other location closer to the ventilation facility that would be able to control the entire system. Examples of remote control for an emergency ventilation facility would be the station emergency control room, the operations control center, a maintenance control center, or an alternate operations control center.

The definition of the term “local control” should not be related to a specific type of system, but rather in general terms such that the term would apply to any system or subsystem as appropriate. The proposed annex section provides clear examples of both local and remote controls.
130- Log #78  Final Action:  (3.3.28 Local Control)

Submitter: Harold A. Locke, Locke & Locke Inc.
Comment on Proposal No: 130-27
Recommendation: Revise text to read as follows:

3.3.28 Local Control. The point of control of the emergency ventilation system or ventilation plant that is remote from the operations control centre. Control over one or more of the system's fire and life safety subsystems at a location in proximity to a designated access point for a station or portion of the guideway.

Substantiation: Although the Committee rejected the proposed revision in Proposal 130-16, Log #1, the statement that the existing language requires revision has validity; therefore, the above revisions are offered for consideration.

130- Log #54  Final Action:  (3.3.31.1 Incidental Occupancy in Stations, 3.3.31.2 Non-System Occupancy Stations, 5.1.1.2, and 5.5.5.5)

Submitter: Robert Montfort, New York City Transit Authority
Comment on Proposal No: 130-5
Recommendation: Recommend retaining the definition of “incidental occupancies” and distinguishing it from “non-system occupancies” by modifying the standard as follows:

3.3.31.1 Incidental Occupancy in 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 Non-system Occupancy Stations. An occupancy not under the control of the system operating authority.

5.1.1.2 Where contiguous commercial non-system occupancies share common space with the station, where incidental occupancies are within the station, or where the station is integrated into a building which is used for the non-system occupancy of which is neither for fixed guideway transit nor passenger rail, special considerations beyond this standard shall be necessary.

5.5.5.5 Where a non-system occupancy or incidental occupancy is located within or contiguous to a station intended for use by other than passengers or employees, the occupant load for that area shall be determined in accordance with the provisions of NFPA 101 as appropriate for the class of occupancy.

Substantiation: By eliminating incidental occupancies, small retail spaces such as; flower shops, shoe repair shops, clothing shops, convenience stores, etc., will become non-system spaces and subject to Paragraph 5.2.3.5 which requires fire separation between system and non-system occupancies. Since retail spaces usually require large display windows or openings in the common walls between it and the transit system to display or sell their products and services, a fire separation would no longer make them economically viable.

Retail spaces, which are within many systems, provide passenger convenience as well as transit system revenue. Retaining incidental occupancies and including the related changes I have submitted and will allow these spaces to continue.

I also recommend that for the next revision cycle that the task force consider developing specific fire life safety requirements to replace "special considerations beyond this standard" in Paragraph 5.1.1.2.

130- Log #118  Final Action:  (3.3.35 Point of Safety)

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-31
Recommendation: Agree with Reject proposal. Added some additional substantiation as noted below.

Substantiation: This definition was added in a recent cycle and the text changes to that proposal were accepted by the Committee. Hard to see the value or what the basis is for including specific ventilation/tenability criteria, particularly since tenability in the structure, including tunnel, may vary depending on the type of materials and/or design of rail transit or passenger rail vehicle operating in those structure or combination of such vehicle operating within such structures.
130- Log #2
(3.34.4.2 Open Station)

Submitter: John Nelsen, Seattle Fire Department
Comment on Proposal No: 130-46
Recommendation: Revise text to read as follows:

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. A station or portion thereof with openings as described in 5.X.X on two or more sides for natural ventilation purposes.

Substantiation: The current definition is vague and ambiguous with respect to how open the structure must be and/or how much smoke and heat must be allowed to disperse directly to the atmosphere and as such is unenforceable. The proposed prescriptive exterior opening requirements proposed for 5.X.X are consistent with those found in NFPA 101, NFPA 5000, NFPA 88A, NFPA 1 and the International Building Code for open parking structures. The approach taken is consistent with the other standards as definitions cannot themselves contain requirements.

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

130- Log #27
(3.3.48 Tenable Environment)

Submitter: Don Tangarone, National Passenger Railway Corp.
Comment on Proposal No: 130-34
Recommendation: Revise text to read as follows:

In a transportation system: An environment that permits the self-rescue of occupants for some, possibly limited time of exposure, or survival a specific period of time. The zone of the tenable environment shall included the location of the passenger rail vehicle fresh air (ventilation) grill or inlet unless the source of fresh air is automatically closed or the passenger rail vehicle HVAC system is automatically turn off in the presence of smoke conditions. Operations involving actions or response by crew members are not considered to "automatic."

Substantiation: By defining the Tenable zone to include the fresh air intakes for passenger rail vehicle, the probability of the coach HVAC releasing smoke into the habitual interior of the vehicle is significantly reduced, thus affording additional time that the passengers can be sheltered in place instead of being evacuated.

EDITORIAL: The reference text has been adjusted to reflect pending ROC cited above. If this is not accepted, text can revert to current wording in standard with no affect upon this comment.

130- Log #119
(3.3.52.1 Fixed Guideway Transit System)

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-36
Recommendation: Add clarifications to include examples of what “special circumstances” are to the Annex Note A.1.1.1, in order to provide more specific guidance for addressing vehicle maintenance.

Substantiation: Agree with Mr. Nott’s comment for his vote for this proposal.

This is not original material; its reference/source is as follows:
130- Log #120
(4.2.1(1))

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-38
Recommendation: Revise to use a different term than “intimate.” Some alternative terms that could be used are “familiar with,” “cognizant of,” “close to.”
Substantiation: Perhaps “aware” is not correct revision but the term “intimate” with the fire” is confusing and I don’t believe the “usage is common” rationale is true, as stated by the Committee statement, outside of NFPA 101. Some other terms that could be used are “familiar with” “cognizant of” “close to.”

130- Log #121
(4.2.1(3))

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-39
Recommendation: Revise to use a different term than “intimate.” See Comment on Proposal 38.
Substantiation: See Comment for Proposal 38.

130- Log #122
(4.3.1)

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-41
Recommendation: See Comment for Proposal 38.
Substantiation: See Comment for Proposal 38.

130- Log #123
(4.3.2)

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-42
Recommendation: See comment for Proposal 38.
**Note: This was misnumbered on Proposal ballot as Section 4.3.1, but it is a different Section (4.3.2) with the same proposed text.
Substantiation: See Comment for Proposal 38.
Stephanie H. Markos, US Department of Transportation

Recommendation: Sincerely believe that the Task Group and the Committee, when considering this proposal to reorganize this Chapter 5 did not consider my concerns relating to the consolidation of the different section headings from 12 to only 4. This reordering / renumbering also appears to make all of the requirements for enclosed stations applicable to ALL stations, including open stations for construction, including seating furniture (Section 5.2.6.3) and rubbish containers (Section 5.2.6.3; and means of egress requirements, including occupancy and illumination/emergency lighting. Is this really the Committee intent? The proposed revisions should be carefully checked to avoid the same type of issues that developed for the reorganization of Chapter 6 Trainway requirements during several revision cycles.

Substantiation: Appears to make the standard more stringent by deleting separate requirements for different types of stations, open or enclosed.

See also issues raised by Mr. Nelsen.

John Nelsen, Seattle Fire Department

Add new text to read as follows:

Each station level shall have wall openings open to the atmosphere, for an area of not less than 0.4 m$^2$ for each linear meter (1.4 ft$^2$ for each linear foot) of its exterior perimeter.

Such openings shall be distributed over 40 percent of the station perimeter or uniformly over two opposing sides.

Interior wall lines and column lines shall be at least 20 percent open, with openings distributed to provide ventilation.

The current definition is vague and ambiguous with respect to how open the structure must be and/or how much smoke and heat must be allowed to disperse directly to the atmosphere and as such is unenforceable. The proposed prescriptive exterior opening requirements proposed for 5.X.X are consistent with those found in NFPA 101, NFPA 5000, NFPA 88A, NFPA 1 and the International Building Code for open parking structures. The approach taken is consistent with the other standards as definitions cannot themselves contain requirements.

Katherine Fagerlund, Sereca Fire Consulting Ltd.

Add new text to read as follows:

The requirements in this Chapter are intended to supplement the requirements of the local building locally applicable codes for the design and construction of stations.

Where these requirements do not address a specific feature of fire protection or life safety, the requirements of the local building codes shall be considered applicable.

The proposed revisions comply with the manual of style requirement that each section contain no more than one sentence. The revised language in the first sentence more accurately reflects the intent.
Stephanie H. Markos, US Department of Transportation 130-48
Change “supplement” to “complement” or another word that is stronger than “supplement.” Committee also needs to address Mr. Nelsen’s Negative vote comments.

The word “supplement” is not clear and therefore is incorrect. NFPA 130 does not supplement the local building code.

Mr. Nelsen has raised some important issues in his Negative vote comments.

Katherine Fagerlund, Sereca Fire Consulting Ltd. 130-46
Add new text to read as follows:

This Chapter applies to all portions of system stations.

Proposed revision is consistent with and replaces the annotation in the original proposal.

Katherine Fagerlund, Sereca Fire Consulting Ltd. 130-46
Revise text to read as follows:

During the course of construction or major modification of any structure, provisions of NFPA 241 shall apply. Where access for firefighting is restricted, standpipes sized for water flow and pressure for the maximum predicted construction fire load shall be installed to within 61 m (200 ft) of the most remote portion of the station. The flow and pressure required at the outlet shall be approved.

Illumination levels of enclosed stations shall not be less than 2.7 lx (0.25 ft-candles) at the walking surface.

Proposed revisions are to re-instate subheading 4.2.1 for clarity, and split Section 5.2.1.2 to comply with manual of style.

John Nelsen, Seattle Fire Department 130-46
Revise text to read as follows:

5.2.1 Safeguards During Construction. During the course of construction or major modification of any structure, provisions of NFPA 241 shall apply except as modified herein.

The reference to “major modification” is undefined and ambiguous as this terminology is not found in NFPA 5000 or NFPA 101; however the term “modification” is found in NFPA 5000/NFPA 101 as follows:

Modification. The reconfiguration of any space, the addition or elimination of any door or window, the addition or elimination of load-bearing elements, the reconfiguration or extension of any system, or the installation of any additional equipment.
5.2.2 Construction.
5.2.2.1 Building construction for all new enclosed stations shall be not less than Type I or Type II or combinations of Type I and Type II noncombustible construction as defined in NFPA 220; in accordance with the requirements of NFPA 101, Chapter 12, and applicable local building codes, for the station configuration or as determined by an engineering analysis of potential fire exposure hazards to the structure.

5.2.2.2 Other types of construction as defined in NFPA 220 shall be permitted for open stations in accordance with the provisions of NFPA 101, Chapter 12, for corresponding station configurations.

Substantiation: Reference to NFPA 101 alone are inadequate as the provisions of NFPA 101 do not address normal building construction features as stated in the following excerpt:

NFPA 101
1.1.6 Areas Not Addressed. The Code does not address the following:
(1)*General fire prevention or building construction features that are normally a function of fire prevention codes and building codes.

Note: Interestingly, according to NFPA 101, 12.1.6, Minimum Construction Requirements and specifically Table 12.1.6 assembly uses below grade in non-sprinklered occupancies are NOT permitted.

5.2.2.3 Where access for firefighting is restricted, standpipes sized for water flow and pressure for the maximum predicted construction fire load shall be installed to within 61 m (200 ft) of the most remote portion of the station. The flow and pressure required at the outlet shall be approved.

Substantiation: Standpipe requirements during construction are contained within NFPA 241, as referenced in Section 5.2.1, Safeguards During Construction; standpipe requirements for finished stations are contained in NFPA 130 Section 5.7.4, Standpipe Systems.

5.2.2.4 Illumination levels of enclosed stations shall not be less than 2.7 lx (0.25 ft-candles) at the walking surface.

Substantiation: While I understand the rationale for a lower level of illumination in tunnels I do not see any justification for such a radical departure from the minimum means of egress illumination requirements of NFPA 101 for stations.

Printed on 9/12/2012
Log #8

John Nelsen, Seattle Fire Department

Comment on Proposal No: 130-46

Recommendation: Delete text to read as follows:

5.2.3 Compartmentation:

5.2.3.1 Interconnected Floor Levels:

5.2.3.1.1 Stair and Escalator Enclosure. Stairs and escalators used by passengers shall not be required to be enclosed.

5.2.3.1.2 Open Stations. Public areas on different levels in open stations are permitted to be interconnected.

5.2.3.1.3 Enclosed Stations. Public areas on different levels in enclosed stations shall be permitted to be interconnected, provided fire separation is not required for smoke control or other fire protection purposes.

5.2.3.2* Separation Between Public and Nonpublic Floor Areas. All public areas shall be fire separated from adjacent nonpublic areas.

5.2.3.3 Ancillary Spaces. Fire resistance ratings of separations between ancillary occupancies shall be established as required by NFPA 101 in accordance with NFPA 251.

5.2.3.4* Agents’ or Information Booths:

5.2.3.4.1 Agents’ or information booths shall be constructed of noncombustible materials.

5.2.3.4.2 Booths used only as agents’ and information booths shall not be required to be fire separated from public station areas.

Substantiation: The requirements for compartmentation are already adequately addressed in local building codes, which would override any conflicting requirements with this standard.

Log #9

John Nelsen, Seattle Fire Department

Comment on Proposal No: 130-46

Recommendation: Revise text to read as follows:

5.2.4 Seating Furniture. Seating furniture in stations shall be noncombustible, or it shall conform to NFPA 101 or local building codes, have limited rates of heat release when tested in accordance with ASTM E 1537, as follows:

(1) The peak rate of heat release for the single seating furniture item shall not exceed 80 kW (270 Btu/hr)

(2) The total energy released by the single seating furniture item during the first 10 minutes of the test shall not exceed 25 MJ (23,700 Btu)

Substantiation: It is not necessary to cover the specific test criteria for other than non-combustible furnishing as they are already addressed in NFPA 101, Chapter 10 and/or local building codes, which would override any conflicting requirements with this standard.
Revised text to read as follows:

Interconnection between floor levels in stations shall be permitted as follows:

1. Stairs and escalators used by passengers shall not be required to be enclosed.
2. Public areas on different levels in open stations are permitted to be interconnected.
3. Public areas on different levels in enclosed stations shall be permitted to be interconnected, provided fire separation is not required for smoke control or other fire protection purposes.

All public areas shall be fire separated from adjacent nonpublic areas.

Proposed revisions are to better link requirements for interconnected floor spaces.

Seating furniture in stations...

Proposed revision is for consistency with manual of style requirements for heading consistency in each section.

Wires and cables used in stations shall provide resistance to fire and the generation of smoke in accordance with the requirements of Chapter 12.

Proposed revisions provide cross-reference to applicable requirements that will be contained in the new chapter addressing requirements for wires and cables. This is consistent with cross-references that are provided elsewhere in the standard (e.g., in Chapters 5 and 6 to emergency ventilation requirements in Chapter 7). The proposed numbering is consistent with the Chapter 5 re-organization proposed in ROP 130-46 Log #151.
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<tr>
<td>101</td>
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<tr>
<td>(5.4.1.5)</td>
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<tr>
<td><strong>Submitter:</strong> Katherine Fagerlund, Sereca Fire Consulting Ltd.</td>
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<tr>
<td><strong>Comment on Proposal No:</strong> 130-209</td>
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<tr>
<td><strong>Recommendation:</strong> Add new text to read as follows:</td>
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<tr>
<td>5.4.9 Circuit Protection. 5.4.1.5 The emergency power, lighting and communications circuits shall be protected from physical damage by system vehicles or other normal system operations and from fire as described in Section 12.4.3.</td>
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<td><strong>Substantiation:</strong> In the proposal, this is part of a section addressing only emergency power circuits, whereas the wording refers to other types of circuits as well and therefore requires a separate section.</td>
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<tr>
<td>30</td>
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<td>(5.4.5)</td>
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<tr>
<td><strong>Submitter:</strong> Kevin Cheong, Applied Engineering Solutions Ltd.</td>
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<tr>
<td><strong>Comment on Proposal No:</strong> 130-51</td>
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<tr>
<td><strong>Recommendation:</strong> Revise text to read as follows:</td>
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<tr>
<td>In enclosed portion of enclosed other than open stations,</td>
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<td><strong>Substantiation:</strong> According to the definitions, stations are either open, or if not fully open, then they are enclosed. Therefore if only a portion of a station is enclosed, the entire station is considered enclosed. The more restrictive requirements (than NFPA 70) are related to flamespread and smoke, especially for wire in raceway. The concern is presumably the spread of fire and smoke in the enclosed portion of stations, rather than the entire area of enclosed stations. The open portion of an enclosed station would presumably be similar in risk to an entirely open station.</td>
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<td>79</td>
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<td>(5.4.5)</td>
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<tr>
<td><strong>Submitter:</strong> Harold A. Locke, Locke &amp; Locke Inc.</td>
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<tr>
<td><strong>Comment on Proposal No:</strong> 130-51</td>
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<tr>
<td><strong>Recommendation:</strong> Revise text to read as follows:</td>
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<tr>
<td>5.4.5 All wires and cables used in enclosed stations in other than open stations shall be listed as being resistant to the spread of fire and shall have reduced smoke emissions by complying with Section 5.4.5.1 or Section 5.4.5.2.</td>
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<td><strong>Substantiation:</strong> The original wording in the proposal is more consistent with defined terminology in NFPA 130.</td>
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<tr>
<td>126</td>
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<tr>
<td>(5.4.5)</td>
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<tr>
<td><strong>Submitter:</strong> Stephanie H. Markos, US Department of Transportation</td>
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<tr>
<td><strong>Comment on Proposal No:</strong> 130-51</td>
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<tr>
<td><strong>Recommendation:</strong> Reinstate previous proposed language: “enclosed stations.”</td>
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<tr>
<td><strong>Substantiation:</strong> Agree with Mr. Locke proposal vote comment.</td>
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Report on Comments – June 2013 NFPA 130

130- Log #153  Final Action:

(5.4.5)

Submitter: James Conrad, RSCC
Comment on Proposal No: 130-51
Recommendation: Revise text to read as follows:
5.4.5 All wires and cables used in enclosed stations shall be listed as being resistant to the spread of fire and shall have reduced smoke emissions, by complying with Section 5.4.5.1 or Section 5.4.5.2.
Substantiation: The proposed text is affirmative language and is clear to the user.

130- Log #154  Final Action:

(5.4.6 (New) )

Submitter: James Conrad, RSCC
Comment on Proposal No: 130-52
Recommendation: Add new text to read as follows:
5.4.6 All wires and cables used for enclosed stations and trainways shall emit less than 2 percent acid gas when tested in accordance with MIL-DTL-24643.
Substantiation: In addition to acid gasses being a known eye irritant and respiratory inhibitor it can also cause the failure of electrical equipment. The committees comment that this surpasses the current minimum standard and accepted practice is not a reason for rejects. This is a life safety standard and by adding an acid gas test to it increases the safety of the critical electrical systems that this standard requires to function during a fire emergency.

130- Log #31  Final Action:

(5.4.6.1)

Submitter: Kevin Cheong, Applied Engineering Solutions Ltd.
Comment on Proposal No: 130-53
Recommendation: Revise text to read as follows:
Fire-resistive cables in accordance with 5.4.10 or limited flame spread and smoke in accordance with 5.4.5.2.
Substantiation: By requiring fire-resistive cabling, this sentence assumes the plenum has a fire emergency function, but that is not necessarily the case. If the plenum is part of a non-emergency systems than it would be appropriate to follow NFPA 70, 92A, 101, etc. criteria for plenum rated cabling. The non-plenum rating for fire-resistive cabling is a relaxation of flame spread and smoke in the interest of continued operation. Therefore, either may have an appropriate application.

130- Log #127  Final Action:

(5.4.8)

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-54
Recommendation: See Mr. Montfort’s proposal vote comments to what circuits should be protected.
Substantiation: Agree with Mr. Montfort’s proposal vote comment.
**Log #10**

**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: NFPA 72, Fire Alarm and Signaling Code, 2010 edition.

**Log #44**

**Submitter:** Marcelo M. Hirschler, GBH International  
**Comment on Proposal No:** 130-57  
**Recommendation:** Revise text to read as follows:  
5.4.10 Fire-resistive cables shall be listed and have a minimum 1-hour fire-resistance rating in accordance with ANSI/UL2196 and shall be installed per the listing requirements.  
6.3.3.2.10 Fire-resistive cables used for emergency lighting and communication shall be listed and have a minimum 1-hour fire-resistance rating in accordance with ANSI/UL 2196 and shall be installed per the listing requirements.  
7.7.10 Fire-resistive cables shall be listed and have a minimum 1-hour fire-resistance rating in accordance with ANSI/UL2196 and shall be installed per the listing requirements.  
**Substantiation:** Accept the proposal. Fire resistive cables exhibit 1 hour fire resistance ratings. As explained by John Devlin and Harold Locke, the cables are fire resistive cables and they exhibit a 1 hour (or more) fire resistance rating.

**Log #80**

**Submitter:** Harold A. Locke, Locke & Locke Inc.  
**Comment on Proposal No:** 130-57  
**Recommendation:** Revise text to read as follows:  
5.4.10 Fire-resistive cables shall be listed and have a minimum 1-hour fire-resistance rating in accordance with ANSI/UL2196 and shall be installed per the listing requirements.  
6.3.3.2.10 Fire-resistive cables used for emergency lighting and communication shall be listed and have a minimum 1-hour fire-resistance rating in accordance with ANSI/UL 2196 and shall be installed per the listing requirements.  
7.7.10 Fire-resistive cables shall be listed and have a minimum 1-hour fire-resistance rating in accordance with ANSI/UL2196 and shall be installed per the listing requirements.  
**Substantiation:** In response to the Committee Statement, while it is true that ANSI/UL 2196 uses the term 'fire resistive' in describing the characteristics of the cables, the correct term with respect to fire rating of the cables is '1-hour fire-resistance rating'. Therefore, the vote on this proposal should be reversed to "accept".
130- Log #128
(5.4.10, 6.3.3.2.10, and 7.7.10)

Final Action:

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-57
Recommendation: Revise text to “1 hour fire resistance rating.”
Substantiation: Agree with Mr. Devlin’s and Mr. Locke’s vote comments.

130- Log #91
(5.4.11)

Submitter: Katherine Fagerlund, Sereca Fire Consulting Ltd.
Comment on Proposal No: 130-46
Recommendation: Revise text to read as follows:

5.4.8.1 Emergency Power.
5.4.8.2 The supply system for emergency purposes...
5.4.8.3 The emergency power system shall have...
5.4.8.4 Selective load pickup and load shedding...
5.4.8.5 Systems connected to the emergency power...

Substantiation: The proposed revision is consistent with the content of the section, which references other types of automatic fire suppression system in addition to sprinklers.

130- Log #93
(5.5.1.3)

Submitter: Katherine Fagerlund, Sereca Fire Consulting Ltd.
Comment on Proposal No: 130-60
Recommendation: Revise text to read as follows:

5.3.3.7 Alternate Egress. At least two means of egress remote from each other shall be provided from each station platform.

1) 5.5.1.3.1 A means of egress used as a public circulation route is permitted to provide more than 50% of the required egress capacity from a station platform or other location.

A.5.5.1.3.1 This requirement is intended to replace...

2) 5.5.1.3 Means of egress from separate platforms shall be permitted to converge.

3) 5.5.1.3.2 Where means of egress routes from separate platforms converge, the subsequent capacity of the egress route shall be sufficient to maintain the required evacuation time from the incident platform.

Substantiation: Revised to clarify that (1) applies also to concourses and other such locations in stations. Revised numbering in the rest of the section is to clarify order and provide a better link to the lead sentence in this section.

130- Log #129
(5.5.1.3 and A.5.5.1.3.1 (New))

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-60
Recommendation: 1) Reinstate word “primary” 2) In addition, for Annex A text, specify what the “other requirements” referred to this standard (130) are being referred to.
Substantiation: 1) Agree with Mr. Nott vote comment that “primary” is correct. 2) The other requirements in new annex are not specified.
Fare barriers or turnstiles shall be designed so that their failure to operate properly will not prohibit movement of passengers in the direction of emergency egress.

Substantiation: Proposed revision is consistent with the intent of revisions to this section to use the term ‘fare barrier’ to refer to all types of equipment that require proof of payment to permit entry.

The occupant load for a station shall be based on the train load of trains simultaneously entering the station on all tracks in normal traffic direction plus the simultaneous entraining load awaiting trains.

1. The train load shall consider only one train at any one track.
2. The basis for calculating train and entraining loads shall be the peak period ridership figures as projected for design of a new system or as updated for an operating system.

5.3.2.2 5.3.2.4 5.5.5.3 For station(s) servicing areas such as civic centers, sports complexes, and convention centers, the peak ridership figures shall consider events that establish occupant loads not included in normal passenger loads.

5.3.2.3 5.3.2.5 5.5.5.4 At multilevel, multiline, or multiplatform stations, occupant loads shall be determined as follows:

1. The maximum occupant load for each platform shall be considered separately for the purpose of sizing the means of egress from that platform.
2. At multilevel stations, multiline, or multiplatform stations, simultaneous loads shall be considered for all egress routes passing through each level of that station.
3. Where an area within a station is intended for use by other than passengers or employees, the occupant load for that area shall be determined in accordance with the provisions of NFPA 101 as appropriate for the use.
4. The additional occupant load shall be included in determining the required egress from that area.
5. The additional occupant load shall be permitted to be omitted from the station occupant load when the area has independent means of egress of sufficient number and capacity.

5.3.2.10 5.5.5.6 Calculation of Platform Occupant Load. The platform occupant load for each platform in a station shall be the maximum peak period occupant load calculated according to 5.5.5.6.1 through 5.5.5.6.4 the following:

1. The peak period occupant load...
2. The entraining load for each platform...
3. The entraining load for each track...
4. Where a platform serves...
5. The train load for each platform...
6. The maximum train load for each track...
7. The maximum train load at each track...

Substantiation: The proposed numerical revisions provide better links to lead sentences in each section. Changes to new 5.3.2.3(2) also eliminate an error in transcribing a proposed revision in the previous cycle (refer to A-2009 ROP, 130-49 Log #156).

The proposed revision to new 5.3.2.3(5) provides consistency with intent, and between the wording for calculation of entraining and train loads.
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| (5.5.5(6)) | 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. |

| 60    |             |
| (5.5.6.2.2) | Submitter: Robert Montfort, New York City Transit Authority  
Comment on Proposal No: 130-63  
Recommendation: This “Accepted in Principle” proposal defines points of safeties as a location protected by a ventilation system in accordance with Chapter 7 that is free from the effects of a train fire. This could be interpreted as allowing points of safeties to have smoke above 2.5 m (8.2 ft) and elevated temperatures. Recommend 5.5.6.2.2 be revised as follows:  
5.5.6.2.2 For enclosed stations equipped with an emergency ventilation system designed in accordance with Chapter 7, where the emergency ventilation system provides protection for the concourse or any other approved location from the exposure to the effects (free of smoke, heat, etc.) of a train fire at the platform as confirmed by engineering analysis, that concourse or any other approved location is permitted to be defined as a point of safety.  
Substantiation: By allowing points of safeties to be spaces protected by emergency ventilation systems in accordance with Chapter 7, spaces could be considered points of safeties if they have heavy smoke above 2.5 m (8.2 ft) and elevated temperatures(=50C). Points of safeties could also be open areas on the platform when the mezzanine is untenable. Points of safeties must be areas where passengers feel safe to congregate during a fire event. It is unlikely they will do so with smoke or high temperatures in the space. Therefore, only spaces that are free of smoke, heat, etc. from a train fire should be considered points of safeties. |

| 130   |             |
| (5.5.6.2.2) | Submitter: Stephanie H. Markos, US Department of Transportation  
Comment on Proposal No: 130-63  
Recommendation: Revise text to agree with Mr. Montfort’s vote comments: Add “free of smoke, heat, etc.” between effects and train fire train fire” after “effects.”  
Substantiation: Agree with Mr. Montfort’s vote comment. |

| 131   |             |
| (5.5.6.2.2) | Submitter: Stephanie H. Markos, US Department of Transportation  
Comment on Proposal No: 130-64  
Recommendation: Delete clause and insert section.  
Substantiation: Correct term is section, not clause. |
John Nelsen, Seattle Fire Department

Comment on Proposal No: 130-46

Recommendation: Delete text to read as follows:

5.5.6.3.2.1 Stairs in the means of egress shall be a minimum of 1120 mm (44 in.) wide.

Substantiation: Minimum stair width as prescribed by NFPA 101 is 44 in. for < 2000 persons and 56 in. 2000 persons; there is no reasonable justification for creating this exception to the NFPA 101 minimum stair widths across the board irrespective of occupant load.
Elevators intended for general public use are permitted to be used for occupant-controlled evacuation when designed and installed in accordance with NFPA 101.

5.5.6.3.3.1 Elevators meeting the requirements of sections 5.5.6.3.3.2 through 5.5.6.3.3.4 shall be permitted to account for part of the means of egress capacity in stations.

5.5.6.3.3.2 Capacity and Numbers. Where elevators are counted as contributing to the means of egress capacity, the following shall apply:

(1) They shall comprise no more than 50 percent of the required egress capacity.
(2) At least one elevator shall be considered out of service, and one elevator shall be reserved for fire service.
(3) The capacity of each elevator shall be the carrying capacity of the elevator within 30 minutes.

5.5.6.3.3.3 Holding Area. Elevators counted as contributing to the means of egress capacity shall be accessed via holding areas or lobbies that shall be designed as follows:

(1) The holding areas or lobbies shall be separated from the platform by a smoke-tight fire separation having a fire resistance rating of at least 1 hour, but not less than the time required to evacuate the holding area occupant load.
(2) At least one stair shall be accessible from the holding area.
(3) The holding area shall be sized to accommodate one person per 0.46 m² (5 ft²).
(4) If the holding area includes portions of the platform, the area within 460 mm (18 in.) of the trainway shall not be considered in the calculation.
(5) Upon activation of smoke control in the platform or adjacent trainway areas, the holding area shall be pressurized to a minimum of 25 Pa (0.051 in. of water gauge).
(6) The holding area shall be provided with emergency voice alarm devices with two-way communication to the system operations control center.

5.5.6.3.3.4 Design Features. Elevators counted as contributing to the means of egress capacity shall be designed as follows:

(1) Shaft enclosures shall be constructed as smoketight fire separations having a 2-hour fire resistance rating.
(2) The design shall limit water flow into the shaft.
(3) No more than two elevators used for means of egress or fire department access shall share the same machine room.
(4) Machine rooms shall be separated from each other by fire separations having a minimum fire resistance rating of 2 hours.
(5) The elevators shall be connected to emergency power.
(6) During emergency evacuation, the elevators shall travel only between the incident platform level and a point of safety.

Substantiation: It is not necessary to cover the specific test criteria for interior finishes as they are already addressed in NFPA 101, Chapter 10 and/or local building codes, which would override any conflicting requirements with this standard.

When the new text allowing the use of elevators for egress was added to the 2010 edition of NFPA 130 the only established, adopted code language regarding such use was found in the 2009 International Building Code and then it was only an issue for high-rise buildings over 420 feet in height. Now however Chapter 7 of the 2012 edition of NFPA 101, Life Safety Code which is reference in Chapter 5 of NFPA 130 contains specific requirements and limitation pertaining to the use of elevator for occupant evacuation. As a result, the existing NFPA 130 text is in direct conflict with NFPA 101; in several areas, a few of which are listed below:

7.14.1.1* Where passenger elevators for general public use are permitted to be used for occupant-controlled evacuation prior to Phase I Emergency Recall Operation mandated by the firefighters' emergency operation provisions of ASME A17.1/CSA B44, Safety Code for Elevators and Escalators, the elevator system shall also comply with this section, except as otherwise permitted by Section 7.14.1.2.

7.14.1.3 Occupant evacuation elevators in accordance with Section 7.14 shall not be permitted to satisfy requirements of this Code applicable to the following:

(1) Number of means of egress
(2) Capacity of means of egress
(3) Arrangement of means of egress

7.14.2.3.1 Conditions necessary for the continued safe operation of the occupant evacuation elevators and the associated elevator lobbies and elevator machine rooms shall be continuously monitored and displayed at the building emergency command center by a standard emergency service interface system meeting the requirements of NFPA 72, National Fire Alarm and Signaling Code, and NEMA SB 30, Fire Service Annunciator and Interface.

7.14.2.4 The building emergency command center location specified in Section 7.14.2.3 shall be provided with a means to override normal elevator operation and to initiate manually a Phase I Emergency Recall Operation of the occupant-controlled elevators in accordance with ASME A17.1/CSA B44, Safety Code for Elevators and Escalators.

7.14.2.5 Occupant evacuation elevator lobbies shall be equipped with a status indicator arranged to display the following:

(1) Illuminated green light and the message “Elevators available for occupant evacuation” while the elevators are operating under emergency conditions but before Phase I Emergency Recall Operation in accordance with the fire fighters’ emergency operation requirements of ASME A17.1/CSA B44, Safety Code for Elevators and Escalators

(2) Illuminated red light and the message “Elevators out of service, use exit stairs” once the elevators are under Phase I Emergency Recall Operation

(3) No illuminated light but the message “Elevators are operating normally” while the elevators are operating under nonemergency conditions.

7.14.3.2* The fire alarm system shall include an emergency voice/alarm communication system in accordance with NFPA 72, National Fire Alarm and Signaling Code, with the ability to provide voice directions on a selective basis to any building floor.

7.14.4.1 The building shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 9.7.1.1(1), except as otherwise specified in Section 7.14.4.2.

7.14.4.2* Sprinklers shall not be installed in elevator machine rooms serving occupant evacuation elevators, and such prohibition shall not cause an otherwise fully sprinklered building to be classified as nonsprinklered.

7.14.7.1 The following features associated with occupant evacuation elevators shall be supplied by both normal power and Type 60, Class 2, Level 1 standby power:

(1) Elevator equipment

(2) Elevator machine room ventilation and cooling equipment

(3) Elevator controller cooling equipment

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130- Log #132 Final Action:

(5.5.6.3.3, 5.5.6.3.4, and A.5.5.6.3.3.4(7) (New) )

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-68
Recommendation: Mr. Nelsen raises important “conflict” issues that the Committee should review and address.
Substantiation: Agree with Mr. Nelsen’s vote comments.
Shaft enclosures shall be constructed as smoketight fire separations having a 2-hour fire-resistance rating.

Substantiation: In this matter I represent CSA B44 (harmonized with ASME A17.1) as a technical subcommittee member. Fire separation rated, smoketight shafts are accomplished by separate swing or slide type doors, not conventional elevator doors. If the elevator is only to be used for occupant controlled evacuation prior to activation of Phase 1 Emergency Recall, which they are, and from CSA B44-07 on that standard (and the equivalent ASME A17.1) require smoke detectors in front of the doors at each landing to control Phase 1 Emergency Recall, it is not necessary to have the shaft smoketight or rated. Having fire doors on elevator shafts is done in some cases (some building codes), but would be very limiting in typical station designs, and is only recommended in this case if the elevators are to be used for evacuation during a fire, rather than before recall is triggered and the shaft is at any risk.

The design shall limit water flow into the shaft.

Substantiation: In this matter I represent CSA B44 (harmonized with ASME A17.1) as a technical subcommittee member. Fire separation rated, smoketight shafts are accomplished by separate swing or slide type doors, with gaskets. This sentence suggests either this, or a slope would be required. The change to allow sprinklers to initiate Phase 1 Recall is being made separately (by me) to B44/A17.1. Regardless, during the period prior to Phase 1 Recall, the risk of sprinklers draining significantly into the shaft are minimal, but if the method of limiting the flow is assumed to be a swing or slide door with gaskets the implication of this sentence on station design seems onerous and unnecessary.

5.5.6.3.4 Elevator Design Features.

Provisions for Phase I emergency recall operation shall be based on analysis of fire scenarios on each level served, and shall demonstrate safe egress for those scenarios.

Substantiation: Editorial revision.
5.7.1 Protective Signaling—Fire Alarm Systems.

5.7.1.1 Stations equipped with fire alarm devices shall be protected by a proprietary system as defined in NFPA 72. A fire alarm system using an approved emergency voice/alarm communication system shall be installed in all enclosed and underground stations with occupant loads of more than 300 in accordance with NFPA 101.

5.7.1.2 Fire alarm systems shall be installed, tested, and maintained in accordance with the applicable requirements of NFPA 70, National Electrical Code, and NFPA 72, National Fire Alarm and Signaling Code except as modified in this section.

5.7.1.3 Manual fire alarm boxes or other approved initiating devices such as emergency telephones (ETEL) shall be located on passenger platforms in accordance with the following:

1. Throughout the stations such that the travel distance from any point in the public area shall not exceed 100 m (325 ft) measured horizontally on the same floor unless otherwise approved.
2. Not less than 42 in. (1.07 m) and not more than 48 in. (1.22 m) above floor level.
3. Within 60 in. (1.52 m) of the exit doorway opening at each exit on each floor.
4. On both sides of grouped openings over 40 ft (12.2 m) in width, and within 60 in. (1.52 m) of each side of the opening.

5.7.2.3.1 Such emergency devices shall be distinctive in color, and their location shall be plainly indicated by appropriate signs.

5.7.1.2* Each station having fire alarm initiating devices shall be provided with a fire alarm annunciator panel at a location that is accessible to emergency response personnel in accordance with NFPA 72:

A.5.7.1.2 Discrete zone indications are desirable for unmanned stations.

5.7.1.2.1 The location of the fire alarm annunciator panel shall be approved.

5.7.1.2.2 Annunciator panels shall announce by audible alarm the activation of any fire alarm-initiating device in the station and visually display the location of the actuated device.

5.7.1.3 When activated, all indicator signals for fire alarms, smoke detection, valve switches, and waterflow shall be transmitted simultaneously to the local station and to the operations control center.

5.7.1.4 Stations equipped with fire alarm devices shall be protected by a proprietary supervising station system as defined in—Where fire alarm systems are provided the OCC shall conform to the requirements of NFPA 72 for proprietary central supervising stations.

5.7.1.4 Separate zones shall be established on local station annunciator panels to monitor waterflow on sprinkler systems and supervise main control valves:

A.5.7.1.4 Separate zones on the annunciator panel to monitor main control valves on standpipe systems should be established.

5.7.1.5 Automatic fire detection shall be provided in all ancillary spaces by the installation of listed combination fixed-temperature and rate-of-rise heat detectors or listed smoke detectors except where protected by automatic sprinklers.

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:

Recommendation: Accept the Public Proposal by adding a new paragraph to read as follows:

5.7.1.6 Fire alarm systems shall be inspected, tested, and maintained in accordance with NFPA 72.

Substantiation: As noted in the original Public Proposal, NFPA 130 already references NFPA 25 and NFPA 10 for inspection, testing, and maintenance requirements. Although the Committee indicates that the document already required ITM per NFPA 72, the paragraph was not identified and I see the paragraph in the draft of the revised Chapter 5.
5.7.2.1 All stations shall be provided with a public address (PA) system and emergency voice alarm reporting devices, such as emergency telephone boxes or manual fire alarm boxes, an emergency communication system (ECS), conforming to NFPA 72, shall be required in stations except as modified in this section.

5.7.2.2 System Classification. Emergency communications systems (ECS) shall consist of two classifications of systems, one-way and two-way.

A.5.7.2.2 One-way emergency communications systems are intended to broadcast information, in an emergency, to personnel in one or more specified indoor or outdoor areas. It is intended that emergency messages be conveyed either by audible or visible textual means or both. This section does not apply to bells, horns, or other sounders and lights, except where used in conjunction with the desired operation of emergency messages and signaling.

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 both to 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 its way.

NFPA 72 contains requirements that can impact the application of emergency communications systems. For instance, coordination of the functions of an emergency communications system with other systems that communicate audibly and/or visibly (such as fire alarm systems, security systems, public address (PA) systems) is essential in order to provide effective communication in an emergency situation. Conflicting or competing signals or messages from different systems could be very confusing to occupants and have a negative impact on the intended occupant response. Where independent systems using audible and/or visible notification are present, the emergency communications system needs to interface with those systems to effect related control actions such as deactivating both audible and visible notification appliances. The use of a single integrated combination system might offer both economic and technical advantages. In any case, coordination between system functions is essential. The coordination of emergency communications systems with other systems should be considered part of the risk analysis for the emergency communications system. (See Figure A.24.3.6.)

Additional documents such as NEMA Standard SB 40, Communications Systems for Life Safety in Schools, can also be used as supplemental resources to provide help with risk assessment and application considerations.

5.7.2.2 The operations control center (OCC) shall serve as the and each system station shall be equipped with an approved emergency voice/alarm communication system so that appropriate announcements can be made regarding fire alarms, including provisions for giving necessary information and directions to the public upon receipt of any manual or automatic fire alarm signal:

5.7.2.2.1 These notification devices shall be placed in approved locations at each facility.

5.7.2.3 Emergency alarm reporting initiating devices such as emergency telephone boxes or manual fire alarm boxes shall be located on passenger platforms and throughout the stations such that the travel distance from any point in the public area shall not exceed 100 m (325 ft) unless otherwise approved.

5.7.2.3.1 Such emergency devices shall be distinctive in color, and their location shall be plainly indicated by appropriate signs.

5.7.2.4 The operations control center (OCC) shall serve as the Emergency Communications System — Central Control Station.

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:

130- Log #90
(5.7.3)

Submitter: Katherine Fagerlund, Sereca Fire Consulting Ltd.
Comment on Proposal No: 130-46
Recommendation: Revise text to read as follows:
5.4.4 5.7.3 Automatic Sprinkler Fire Suppression Systems.
Substantiation: The proposed revision is consistent with the content of the section, which references other types of
automatic fire suppression system in addition to sprinklers.

130- Log #133
(5.7.3.1)

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-91
Recommendation: Underline new added text as noted by Mr. Martineau and Mr. Montfort in their vote comments.
Substantiation: New text should be underlined to make clear what the new text is.

130- Log #61
(5.7.3.1 and A.5.7.3.1 (New))

Submitter: Robert Montfort, New York City Transit Authority
Comment on Proposal No: 130-91
Recommendation: This may be editorial, but it is submitted to insure change is correctly made. New Annex A.5.7.3.1
should be underlined and paragraph 5.7.3.1 should have an asterisk. The paragraphs should be presented as follows.
5.7.3.1* An automatic sprinkler protection system shall be provided in areas of stations used for concessions, in
storage areas, in trash rooms, and in the steel truss area of all escalators and other similar areas with combustible
loadings, except trainways.
A.5.7.3.1 Escalators constructed of combustible stairs should be protected with an approved automatic sprinkler or fire
suppression system installed in the truss area and designed to control or extinguish a fire.
Substantiation: The format for the proposal is not correct. The annex is new and should be underlined and the
paragraph it refers to should have an asterisk.
Katherine Fagerlund, Sereca Fire Consulting Ltd.

**Comment on Proposal No:** 130-91

**Recommendation:** Add new text to read as follows:

5.7.3.1* An automatic sprinkler protection system shall be provided in ...  
A.5.7.3.1 Escalators constructed of combustible stairs should be protected with an approved automatic sprinkler or fire suppression system installed in the truss area and designed to control or extinguish a fire.

**Substantiation:** This comment is editorial and is consistent with ROP ballot comments submitted by R Montfort to the original proposal.

Stephanie H. Markos, US Department of Transportation

**Comment on Proposal No:** 130-94

**Recommendation:** Underline new added annex note * as noted by Mr. Martineau and Mr. Montfort.

**Substantiation:** “*” should be underlined to make clear that new annex text is added.

This is not original material; its reference/source is as follows: Mr. Martineau's and Mr. Montfort's vote comments.

Robert Montfort, New York City Transit Authority

**Comment on Proposal No:** 130-95

**Recommendation:** The committee substantiation statement for the rejection of this proposal “that this is a design requirement of NFPA 14” is not valid as the sole reason for rejection. Recommend the substantiation statement be revised to state:

“The proposal as written does not clarify the requirement as to which standpipe or portions of standpipes and therefore, the technical committee did not agree to modify the requirement.”

**Substantiation:** NFPA 14 should not be the sole reason for rejecting a proposal. There are many areas in NFPA 130 where another NFPA Standard, including NFPA 14, are referenced and also includes the statement, “except as modified herein”. The reason for this is that these standards do not adequately address train stations and tunnels and do not always take into account all associated issues.
Robert Montfort, New York City Transit Authority

**Comment on Proposal No:** 130-96

**Recommendation:** The committee substantiation statement for the rejection of this proposal “that this is a design requirement of NFPA 14” is not valid as the sole reason for rejection. Recommend the substantiation statement be revised to state:

“The proposal as written does not clarify the requirement as to which standpipe or portions of standpipes and therefore, the technical committee did not agree to modify the requirement.”

**Substantiation:** NFPA 14 should not be the sole reason for rejecting a proposal. There are many areas in NFPA 130 where another NFPA Standard, including NFPA 14, are referenced and also includes the statement, “except as modified herein”. The reason for this is that these standards do not adequately address transit stations and tunnels, and do not always take into account all associated issues.

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Robert Montfort, New York City Transit Authority

**Comment on Proposal No:** 130-97

**Recommendation:** The committee substantiation statement for the rejection of this proposal “that this is a design requirement of NFPA 14” is not valid as the sole reason for rejection. Recommend the substantiation statement be revised to state:

“The proposal as written does not clarify the requirement as to locations of hose connections and therefore, the technical committee did not agree to modify the requirement.”

**Substantiation:** NFPA 14 should not be the sole reason for rejecting a proposal. There are many areas in NFPA 130 where another NFPA Standard, including NFPA 14, are referenced and also includes the statement, “except as modified herein”. The reason for this is that these standards do not adequately address transit stations and tunnels, and do not always take into account all associated issues.

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Stephanie H. Markos, US Department of Transportation

**Comment on Proposal No:** 130-95

**Recommendation:** Add clarification statement to Committee statement, as noted by Mr. Montfort. Note: This is also applicable to Proposals 96, 97, 98, 139, 140, 141, etc., which I will not repeat each one.

**Substantiation:** Mr. Montfort’s raises a point for each proposal that appears to require further review and discussion. This is not original material; its reference/source is as follows:

Mr. Montfort's vote comment.
Robert Montfort, New York City Transit Authority

Recommendation: This proposal provided design requirements for dry standpipes and was rejected by the committee because standpipe design requirements are a part of NFPA 14. While NFPA 14 provide design requirements, they were developed for structures and not transit systems that can have different requirements. Both the filling time or system volume requirement in NFPA 14 will make the installation of dry standpipe system infeasible in large stations in cold climates.

Recommend the following new text which was proposed and submitted by Katherine Fagerlund be accepted. Standpipes shall be permitted to be of the dry type with the approval of the authority having jurisdiction provided the following conditions are met:

1. Systems shall be installed in a manner so that the water is delivered to all hose connections on the system in 10 minutes or less.
2. Combination air relief-vacuum valves shall be installed at each high point on the system.

Calculation, including transit and fill times, should be submitted to the authority having jurisdiction to support this requirement.

Dry standpipe systems are a necessity for systems in cold climates. Wet systems would require extensive heat tracing which would be expensive and difficult to maintain. Applying NFPA 14 requirements for filling time or maximum volume would be too onerous and make the installation of dry standpipes in large transit stations impractical. Considering the time it takes fire fighters to suit up, get their gear, descend into the system and verified third rail power removal, the 10 minute requirement in NFPA 502 to deliver water to all hose valves is not unreasonable. The use of air relief valves is also a worthwhile requirement since they can significantly reduce the time to fill the standpipe. It should be noted that NYCT has many dry standpipe systems installed and FDNY has never indicated any problem with a ten minute fill time. The substantiation contained within the original proposal would also apply.

NFPA 14 should not be the sole reason for rejecting a proposal. The Standard recognizes in paragraph 5.7.4.1 that not all the requirements contain in NFPA 14 can be applied to transit stations and tunnels by stating "except as modified herein."

Robert Montfort, New York City Transit Authority

Comment on Proposal No:  130-99

Recommendation: The committee substantiation statement for the rejection of this proposal “that this is a design requirement of NFPA 14" is not valid as the sole reason for rejection. Recommend the substantiation statement be revised to state:

"The proposal as written does no provide any additional clarify to the requirements and therefore, the technical committee did not agree to modify the requirement."

Substantiation: NFPA 14 should not be the sole reason for rejecting a proposal. There are many areas in NFPA 130 where another NFPA Standard, including NFPA 14, are referenced and also includes the statement, "except as modified herein". These referenced standards may not adequately address transit stations and tunnels, and do not always take into account all associated issues.
130- Log #67
(5.7.4.2.1 (New) )

**Final Action:**

**Submitter:** Robert Montfort, New York City Transit Authority

**Comment on Proposal No:** 130-100

**Recommendation:** This proposal was rejected based solely on it is a design requirement of NFPA 14 which is not correct since NFPA 130 modifies 14 as appropriate for transit systems. It is recommended that the proposed change be reconsidered on it merit relating to transit systems. Therefore recommend adding the following new text:

5.7.4.2.1 Dry standpipes may be concealed without the piping integrity being monitored with a supervisory air pressure.

**Substantiation:** The 2007 edition of NFPA 14 was changed to require dry standpipes with any concealed piping to be monitored with supervisory air. This is an onerous requirement for transit systems that is not considered necessary. Standpipes are tested by the fire department on an annual basis and after any repair work to the system. Adding this additional maintenance burden and cost is not justified.

130- Log #15
(5.7.6)

**Final Action:**

**Submitter:** John Nelsen, Seattle Fire Department

**Comment on Proposal No:** 130-17

**Recommendation:** Revise text to read as follows:

5.7.6° Emergency Fire Command Center.

5.7.6.1 Underground stations shall be provided with a fire an emergency command center conforming to NFPA 101, Section 11.8.6, in accordance with and 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:

130-     Log #17
Final Action:

Submitter: John Nelsen, Seattle Fire Department
Comment on Proposal No:  130-46
Recommendation:  Delete text to read as follows:

5.9 Interior Finish:
5.9.1 Enclosed Stations:
5.9.1.1—Interior wall and ceiling finish materials in enclosed stations shall comply with one of the following:
(1) Interior wall and ceiling finish materials shall be noncombustible materials.
(2) Interior wall and ceiling finish materials, other than textile wall coverings or foam plastic insulation, shall exhibit a flame spread index not exceeding 25 and a smoke developed index not exceeding 450, when tested by ASTM E 84.
5.9.1.2—Interior wall and ceiling finish materials, when 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) During the 160 kW (545 kBTU/hr) exposure, the following criteria shall be met:
(a) Flame shall not spread to the outer extremities of the sample on the 2.45 m × 3.7 m (8 ft × 12 ft) wall.
(b) The peak heat release rate shall not exceed 800 kW (2730 kBTU/hr).
(c) Flashover shall not occur.
(3) The total smoke released throughout the test shall not exceed 1000 m2 (10,764 ft²).
5.9.2.1—Interior floor finish materials in enclosed stations shall be noncombustible or shall exhibit a critical radiant flux not less than 0.8 W/cm² when tested in accordance with ASTM E 648.
5.9.2.2—Interior finish in open stations shall comply with the requirements of NFPA 101, Chapter 12.
Substantiation:  It is not necessary to cover the specific test criteria for interior finishes as they are already addressed in NFPA 101, Chapter 10 and/or local building codes, which would override any conflicting requirements with this standard.

130-     Log #96
Final Action:

Submitter: Katherine Fagerlund, Sereca Fire Consulting Ltd.
Comment on Proposal No:  130-107
Recommendation:  Revise text to read as follows:

5.2.5 5.9 Interior Finish.
5.9.1 Enclosed Stations
5.2.5.1 5.9.1.1—Interior wall and ceiling materials in enclosed stations shall comply with…
5.2.5.2 5.9.1.2—Interior wall and ceiling materials tested in accordance with NFPA 286 shall…
5.2.5.3 5.9.1.3—The following materials shall not be used as interior wall or ceiling or ceiling finishes…
5.2.5.4 5.9.1.4—Interior floor finish materials in enclosed stations shall…
Substantiation:  Proposed revisions are to coordinate with Chapter 5 re-organization [ROP 130-46 Log #151] and per manual of style requirements for heading consistency in each section.

Printed on  9/12/2012  47
**5.10 Rubbish Containers.** Rubbish containers shall comply with 5.10.1 or 5.10.2.

**5.10.1 Rubbish containers that remain in place in the station shall** be manufactured of noncombustible materials.

**5.10.2 Rubbish containers that are used in the station on a temporary basis, for example 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 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m², in the horizontal orientation.

**Substantiation:** The committee pointed out that it wants the fixed containers that remain permanently in place in stations to be noncombustible. However, rubbish containers wheeled in (or brought in during cleaning in other ways) also need to comply with some requirements. Note that large rubbish containers (such as the ones used for disposal of the materials in fixed rubbish containers, can exhibit very high heat release rates (over 13 MW from a 22 pound container). Such portable containers are rarely constructed of noncombustible materials and, therefore, some protection is required to ensure massive sources of heat are not brought into stations.

The following information is contained in NFPA 1, the Fire Code:

**A.19.2.1.2.1** 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 E1354 or NFPA 271 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 40 kW/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 8,000). A detailed review of listings or approvals is advised prior to acceptance.

****Insert 130_Tbl A.19.2.1.2.1_L45_sub Here****

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**5.2.6.4 Lockers.** Lockers shall be constructed of...

**Substantiation:** Proposed revision is for consistency with manual of style requirements for heading consistency in each section.
Table A.19.2.1.2.1 Peak Rate of Heat Release of Materials in the Cone Calorimeter at an Incident Heat Flux of 40 kW/m², in the Horizontal Orientation, at a Thickness of 6 mm

<table>
<thead>
<tr>
<th>Material Description</th>
<th>Abbreviation</th>
<th>Peak Rate of Heat Release (kW/m²)</th>
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</thead>
<tbody>
<tr>
<td>1 Polytetrafluorethylene</td>
<td>PTFE</td>
<td>14</td>
</tr>
<tr>
<td>2 Poly(vinyl chloride) flexible 1</td>
<td>PVC Plenum 1</td>
<td>43</td>
</tr>
<tr>
<td>3 Poly(vinyl chloride) flexible 2</td>
<td>PVC Plenum 2</td>
<td>64</td>
</tr>
<tr>
<td>4 Poly(vinyl chloride) flexible 3</td>
<td>PVC Plenum 3</td>
<td>87</td>
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<tr>
<td>5 Polycarbonate 1</td>
<td>PolyCarb 1</td>
<td>429</td>
</tr>
<tr>
<td>6 Poly(vinyl chloride) flexible 4</td>
<td>PVC Plenum 4</td>
<td>77</td>
</tr>
<tr>
<td>7 Chlorinated PVC</td>
<td>CPVC</td>
<td>84</td>
</tr>
<tr>
<td>8 Poly(vinyl chloride) rigid computer housing</td>
<td>PVC computer</td>
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</tr>
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<td>9 Poly(vinyl chloride) flexible wire FR</td>
<td>PVC flex FR</td>
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</tr>
<tr>
<td>10 Poly(vinyl chloride) rigid low smoke</td>
<td>PVC low smoke</td>
<td>111</td>
</tr>
<tr>
<td>11 Cross linked polyethylene FR</td>
<td>XLPE FR</td>
<td>192</td>
</tr>
<tr>
<td>12 Poly(vinyl chloride) flexible wire semi FR</td>
<td>PVC Flex semi FR</td>
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</tr>
<tr>
<td>13 Poly(vinyl chloride) rigid window</td>
<td>PVC window</td>
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</tr>
<tr>
<td>14 Poly(vinyl chloride) flexible wire non FR</td>
<td>PVC Flex non FR</td>
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<td>PMMA FR</td>
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<td>20 Acrylonitrile butadiene styrene FR 2</td>
<td>ABS FR 2</td>
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</tr>
<tr>
<td>21 Poly(vinyl chloride) flexible bath curtain</td>
<td>PVC Flex Poor</td>
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<td>22 Douglas fir</td>
<td>D Fir</td>
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<td>23 Polystyrene FR</td>
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<td>25</td>
<td>Polyurethane Flexible Foam non FR</td>
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<td>Nylon</td>
<td>Nylon</td>
</tr>
<tr>
<td>29</td>
<td>Acrylonitrile butadiene styrene</td>
<td>ABS</td>
</tr>
<tr>
<td>30</td>
<td>Polystyrene</td>
<td>PS</td>
</tr>
<tr>
<td>31</td>
<td>Styrene acrylonitrile EPDM blend</td>
<td>EPDM SAN</td>
</tr>
<tr>
<td>32</td>
<td>Poly(butylene terephthalate)</td>
<td>PBT</td>
</tr>
<tr>
<td>33</td>
<td>Poly(ethylene terephthalate)</td>
<td>PET</td>
</tr>
<tr>
<td>34</td>
<td>Polyethylene</td>
<td>PE</td>
</tr>
<tr>
<td>35</td>
<td>Polypropylene</td>
<td>PP</td>
</tr>
</tbody>
</table>

Stephanie H. Markos, US Department of Transportation

130- Log #135
(Chapter 6)

Final Action:

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No:  130-111
Recommendation: See substantiation.
Substantiation: Since proposed reordering of both Chapters 5 and 6 WERE submitted to the Committee, as proposals for this ROP, this proposal should have been Accept in Principle, NOT Rejected. The comment was held from  
Comment 54 in 2009 cycle included specific recommendation for the Committee to carefully review Chapters 5 and 6 in terms of the logic, particularly due to acceptance of Comments 147 and 220 in 2007 cycle, the intent of which was reduce duplication of text but which introduced inadvertent revisions which resulted in either too stringent or less stringent requirements.

130- Log #136
(Chapter 6)

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No:  130-112
Recommendation: This proposal should have been Rejected by the Committee, NOT Accepted in Principle.
Substantiation: This proposal appeared as Comment 130-55 in the 2009 Cycle, but was held. That Comment 55 did not contain ANY underline or other marking to indicate the former section numbers and the new section numbers. Therefore, I believed during the 2009 cycle that the Comment should have been Rejected. The Committee statement in 2009 was “due to there not being enough time to evaluate it during the ROC stage” which made it impossible to meaningful or otherwise understand what the proposal intended to do or it’s actual effect.

130- Log #137
(Chapter 6)

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No:  130-113
Recommendation: Revise Chapter 6 as follows:

***Insert 130_L137_Rec_ROC_A2013 ****

Substantiation: Continue to believe, that due to the time constraints from the necessity to review so other many specific technical proposals for the Stations and Trainway chapters, neither the Task Group nor the Committee was able to meaningfully evaluate either the revisions proposed in this Proposal or Proposal 113. Believe that the consolidation to move certain sections relating to emergency access to Protection section is not warranted. The reordering of certain sections and deletion of certain headings in the Means of Egress section appears to now require application of unintended, more stringent requirements for elevated and surface trainways, that were historically applied only to
The italics in 3rd column respond to Proposal 113, Log #152. Yellow highlight is for emphasis and to mark revision from those in Proposal 114, Log #224.

### Chapter 6 Proposed Reorganization (and minor related revisions)

<table>
<thead>
<tr>
<th>Existing 2010 Section Number</th>
<th>New Section Number</th>
<th>Text</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>6.1</td>
<td><strong>General</strong></td>
<td>Return to 2003 Heading text and numbering.</td>
</tr>
</tbody>
</table>
| 6.1                          | 6.1.1             | * Applicability  
This chapter applies to all portions of the trainway, including pocket storage and tail tracks not intended for occupancy by passengers | 2003 and per #113 and 114 |
| -                            | 6.1.2             | **Use and Occupancy** | |
| 6.2.1.12                     | 6.1.2.1           | Passengers shall enter the trainways only in the event that it becomes necessary to evacuate a train | 2003 and per #113 and 114 |
| 6.2.1.13                     | 6.1.2.2           | Evacuation shall take place only under the guidance and control of authorized, trained system employees or other authorized personnel as warranted under an emergency situation | 2003 and per #113 and 114 |
| 6.2.6                        | 6.1.3             | **Warning Signs**  
*This is ok to move to 6.3, but please revise per below to make a list* | Move to be in 6.3 per #113 but … |
| 6.2.6.1                      | 6.1.2.1           | Warning signs shall be posted:  
(1) On entrances to the trainway (i.e., station platforms and portals),  
(2) On fences or barriers adjacent to the trainway, and  
(3) All such other locations where non-system transit authority employees might trespass | No text changes except to make a list and more definitive (i.e.,) |
The italics in 3 rd column respond to Proposal 113, Log #152. Yellow highlight is for emphasis and to mark revision from those in Proposal 114, Log #224.

<table>
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</thead>
<tbody>
<tr>
<td><strong>6.2.6.2</strong></td>
<td><strong>6.1.2.2</strong></td>
<td>Warning signs shall clearly state: The hazard (e.g., DANGER HIGH VOLTAGE—750 VOLTS) with letter sizes and colors in conformance with NFPA 70 and Occupational Safety and Health Administration (OSHA) requirements.</td>
<td>No text change but to make a list, too.</td>
</tr>
<tr>
<td>6.2</td>
<td>6.3</td>
<td>Means of Egress</td>
<td>Moved per #113 to be 6.3 (Moved to be 6.6 per #114).</td>
</tr>
<tr>
<td>6.3</td>
<td>6.2</td>
<td>Construction</td>
<td></td>
</tr>
<tr>
<td>6.5.3</td>
<td>6.2.1</td>
<td>Standpipe Installation in Tunnels - Safeguards During Under Construction</td>
<td>Renumbered to be consistent with Chapter 5. Per #113 and #114.</td>
</tr>
<tr>
<td>6.5.3.1</td>
<td>6.2.1.1</td>
<td>A standpipe system shall be installed in enclosed guideways tunnels under construction in accordance with NFPA 241</td>
<td>Consistent with 2003 heading and moved forward from “Protection” in 2010 to be consistent with Chapter 5.</td>
</tr>
<tr>
<td>6.5.3.1.4</td>
<td>6.2.1.2</td>
<td>A standpipe system shall be installed before the enclosed trainway has exceeded a length of 61 m (200 ft) beyond any access shaft or portal and shall be extended as work progresses to within 61 m (200 ft) of the most remote portion of the enclosed trainway.</td>
<td>See revision above for consistency. What is the difference between enclosed and tunnel, and trainway?</td>
</tr>
<tr>
<td>6.5.3.1.2</td>
<td>6.1.2.3</td>
<td>Standpipes shall be sized for approved water flow and pressure at the outlet, based upon the maximum predicted fire load</td>
<td></td>
</tr>
<tr>
<td>6.5.3.2</td>
<td>6.1.2.4</td>
<td>Reducers or adapters shall be: provided and attached for connection of the contractor's hose.</td>
<td>Per #113 and #114. Renumbered to reduce repeated text.</td>
</tr>
<tr>
<td>6.5.3.2</td>
<td>(1)</td>
<td>Provided and attached for connection of the contractor's hose</td>
<td></td>
</tr>
<tr>
<td>6.5.2.3</td>
<td>(2)</td>
<td>Reducers or adapters shall be readily removable through the use of a fire fighter's hose spanner wrench.</td>
<td></td>
</tr>
<tr>
<td>6.5.3.4</td>
<td>6.2.2.4</td>
<td>Risers shall be identified with signs as outlined in 6.5.2.4</td>
<td>Make list below</td>
</tr>
</tbody>
</table>

130_Log 137 and Log 138_Rec_ROC_A2013
The italics in 3rd column respond to Proposal 113, Log #152. Yellow highlight is for emphasis and to mark revision from those in Proposal 114, Log #224.

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</thead>
<tbody>
<tr>
<td>6.5.3.4</td>
<td>(1)</td>
<td>Risers shall be identified with signs as outlined in 6.5.2.4</td>
</tr>
<tr>
<td>6.5.3.5</td>
<td>(2)</td>
<td>Risers shall be readily accessible for fire department use</td>
</tr>
<tr>
<td>6.5.3.6</td>
<td>(3)</td>
<td>Risers shall be protected from accidental damage</td>
</tr>
<tr>
<td>6.5.3.7*</td>
<td>6.2.1.6*</td>
<td><strong>Illumination.</strong> Illumination levels of enclosed trainways shall not be less than 2.7 lx (0.25 ft-candles) at the walking surface</td>
</tr>
</tbody>
</table>

**Note:** The heading was included in #113 but is not words are not included as in previous subheadings

<table>
<thead>
<tr>
<th>6.3</th>
<th>6.2.2</th>
<th><strong>Construction Type Materials</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>“Type” as heading in included in #113. The only non “enclosed subway” subsections would be walking surfaces and coverboards, which could be in the other sections as marked Wiring is not only subway so should remain a separate section since it applies to all and then specific… Underwater is not “underground”? But still mentioned in 3rd item below ”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.3.1</th>
<th></th>
<th><strong>General Underground and Underwater (Subway)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>6.3.1.1</td>
<td>6.2.3.1</td>
<td><strong>Underground (Subways)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>See above Delete unnecessary headings added in #113 below</td>
</tr>
<tr>
<td>6.3.1.1.1</td>
<td>6.2.2.1</td>
<td><strong>Cut and Cover</strong> Where trainway sections are to be constructed by the cut-and-cover method, perimeter walls and related construction shall be not less than Type I or Type II 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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Heading not needed for these for this level of section number</td>
</tr>
</tbody>
</table>

130_Log 137 and Log 138_Rec_ROC_A2013
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<thead>
<tr>
<th>Section</th>
<th>Subsection</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.3.1.1.2.</td>
<td>6.2.2.2</td>
<td><strong>Bored Tunnels</strong> Where trainway sections are to be constructed by a bored tunneling method through earth, unprotected steel liners, reinforced concrete, shotcrete, or equivalent shall be used.</td>
</tr>
<tr>
<td>6.3.1.1.2.1</td>
<td>6.2.2.3</td>
<td><strong>Rock tunnels</strong> Rock tunnels shall be permitted to utilize steel bents with concrete liner if lining is required.</td>
</tr>
<tr>
<td>6.3.1.1.2.4</td>
<td>6.2.2.4</td>
<td>Underwater tubes shall be not less than Type II (000) noncombustible construction as defined in NFPA 220, as applicable.</td>
</tr>
<tr>
<td>6.6</td>
<td>6.2.3</td>
<td><strong>Flammable and Combustible Liquids Intrusion</strong> (And subheading text) Moved here per #113. SM comment: This is still out of place? Why not move to Ventilation chapter?</td>
</tr>
<tr>
<td>6.3.1.1.3</td>
<td>6.2.6</td>
<td><strong>Walking Surface</strong>. Walking surfaces designated for evacuation of passengers shall be constructed of noncombustible materials. Renumbered per #113. SM Comment: The retained heading and then the 4 number subheading text is not necessary! Is this really desired for other than enclosed stations? Renumber to be 6.2.5 after the rail ties section.</td>
</tr>
<tr>
<td>6.3.1.1.5</td>
<td>6.2.4</td>
<td><strong>Rail Ties</strong>. 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 1362 except as permitted below #113 renumbered to 6.2.3. SM Comment: Renumber to be 6.2.4 since this topic is before walking surface for evacuation. SM Comment: Delete underground to be more general and add text to make the next section part of a list per #114.</td>
</tr>
<tr>
<td>6.3.1.1.5.1</td>
<td>(1)</td>
<td>Rail ties used at enclosed switch or crossover locations shall comply with 6.3.1.5.4. Make list. SM Comment: The</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Section</th>
<th>6.2.3.1.6</th>
<th>Location of the switches should be specified. Or are ALL of the ties really required to meet NFPA 703?</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.3.1.5.2</td>
<td>Rail ties and tie blocks in enclosed underground, enclosed track sections shall be permitted to be of wood encased in concrete such that only the top surface is exposed</td>
<td>SM Comment: Delete underground</td>
</tr>
<tr>
<td>6.3.1.6</td>
<td>Structures. Remote vertical exit shafts and ventilation structures shall be not less than Type I (332) noncombustible construction as defined in NFPA 220</td>
<td>Disagree with #113 moving this and next section to precede the rail tie section, since the rail ties are integral part of the trainway. Heading not necessary. Moved to precede the “ancillary areas” and deleted heading text to be consistent with section numbering above.</td>
</tr>
<tr>
<td>6.3.1.7</td>
<td>Ancillary Areas. Compartmentation</td>
<td>See above. Separate heading not necessary.</td>
</tr>
<tr>
<td>6.3.1.7.1</td>
<td>Ancillary areas shall be separated from trainway areas within: Enclosed underwater trainway sections by a minimum of 3.2-hour fire-resistive construction</td>
<td>Deleted repetitive text and reversed order to put underground first. What about “enclosed” trainways?</td>
</tr>
<tr>
<td>6.3.1.7.2</td>
<td>Ancillary areas shall be separated from trainway areas within underground Underwater trainway sections by a minimum of 23-hour fire-resistive construction</td>
<td>SM comment: reverse order of items in this section to go from less strict to more strict, enclosed and then underwater? What is difference between underground and enclosed instead of Make list</td>
</tr>
<tr>
<td>6.3.2</td>
<td>Surface: Construction materials for surface trainways shall be not less than Type II (000) noncombustible material as defined in NFPA 220, as determined by an engineering</td>
<td>Moved to earlier in section and deleted text per #113 SM comment: heading word not</td>
</tr>
</tbody>
</table>

130_Log 137 and Log 138_Rec_ROC_A2013
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| | analysis of potential fire exposure hazards to the structure | necessary |
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</thead>
<tbody>
<tr>
<td>6.3.1.3</td>
<td>6.2.2.7</td>
<td>Elevated. All structures necessary for trainway support and all structures and on or under elevated trainways shall be not less than Type I or Type II (000) or combinations of Type I or Type II noncombustible material as defined in NFPA 220, as determined by an engineering analysis of potential fire exposure hazards to the structure.</td>
<td>This was omitted in error from #114. SM Comment: Word heading is not necessary</td>
</tr>
<tr>
<td>6.3.2 and Subsections</td>
<td>6.X</td>
<td>Ventilation</td>
<td>Move entirety to Protection section and renumber accordingly.</td>
</tr>
<tr>
<td>6.3.3</td>
<td>6.2.9</td>
<td>Wiring Requirements – General* <em>(See section 5.4)</em></td>
<td>Per #113 Why “See 5.4?” The whole thing? Why? SM Comment: Will be a moot point when Chapter 12 is adopted.</td>
</tr>
<tr>
<td>6.3.3.1</td>
<td>6.2.9.1</td>
<td>General* All wiring materials and installations other than those for traction power shall conform to the requirements of NFPA 70</td>
<td>The next 2 sections were left over from 2007 edition in 2010 revision.</td>
</tr>
<tr>
<td>6.3.3.1.1</td>
<td></td>
<td>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.</td>
<td>Should have been deleted. Unnecessarily repeat what is in traction power section. This is exact text as was then in 6.3.2 Surface in 2003.</td>
</tr>
<tr>
<td>6.3.3.1.2</td>
<td></td>
<td>Life safety and fire protection criteria for the subsystem installed in the trainway shall conform to the requirements for underground trainways that are listed in 6.4.2.</td>
<td>See above. This is exact text as was then in 6.3.3 Elevated in 2003.</td>
</tr>
<tr>
<td>6.3.3.1.3</td>
<td></td>
<td>All wiring materials and installations other than those for traction power shall conform to the requirements of NFPA 70</td>
<td>Moved up to be the sole item under General when the 2 sections above left from 2003 are deleted.</td>
</tr>
</tbody>
</table>
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</thead>
<tbody>
<tr>
<td><strong>6.3.3.3</strong></td>
<td>6.2.10</td>
<td>Enclosed Trainways and Structures Underground, (Subways).</td>
<td>Per #113. SM Comment: Why not change heading to Enclosed to be more general and include underwater since they are also important and “confined” spaces with ventilation What about wire in structures other than trainways of whatever type</td>
</tr>
<tr>
<td><strong>6.3.3.2.1</strong></td>
<td>6.2.10.1</td>
<td>All wiring materials and installations within enclosed underground trainways, other than for traction power (see Section x.x.x) shall conform to the requirements of NFPA 70 and, in addition, shall satisfy to the requirements of 6.2.9 6.3.3.2.2 through 6.3.3.2.9–6 Underground and other revised text added per #113. SM comment: Delete underground and insert enclosed.</td>
<td></td>
</tr>
<tr>
<td><strong>6.3.3.2.2</strong></td>
<td>6.2.10.2</td>
<td>Conduits, raceways, ducts, boxes, cabinets, and equipment enclosures shall be constructed of noncombustible materials in accordance with the requirements of ASTM E 136.</td>
<td></td>
</tr>
<tr>
<td><strong>6.3.3.2.3</strong></td>
<td>6.2.10.3</td>
<td>All conductors shall be insulated</td>
<td></td>
</tr>
<tr>
<td><strong>6.3.3.2.3.1</strong></td>
<td>6.2.10.4 (1)</td>
<td>Ground wires installed in a metallic raceway shall be insulated Make list.</td>
<td></td>
</tr>
<tr>
<td><strong>6.3.3.2.3.2</strong></td>
<td>6.2.10.5 (2)</td>
<td>Other ground wires shall be permitted to be bare Are conductors the same as ground wires? These 2 sections have historically been part of the conductor insulations section</td>
<td></td>
</tr>
<tr>
<td><strong>6.3.3.2.4</strong></td>
<td>6.2.10.6 6.2.10.4</td>
<td>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 Renumber</td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td>(1)</td>
<td>75°C (167°F) for listed fire-resistive cables</td>
<td></td>
</tr>
</tbody>
</table>
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| (2) | (2) | 90°C (194°F) for all other applications |
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</thead>
<tbody>
<tr>
<td>6.3.3.2.4.1</td>
<td>6.2.10.7</td>
<td>All insulated conductors and cables shall be listed for wet locations</td>
<td>Not necessary to be under the previous long heading number</td>
</tr>
<tr>
<td></td>
<td>6.2.10.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3.3.2.5</td>
<td>6.2.10.8</td>
<td>All wires and cables used, other than traction power cables (see section 6.X) 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 one of the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.2.10.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3.3.2.5.1</td>
<td>6.2.10.9</td>
<td>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 or</td>
<td><em>SM Comment: Make this and next section a list under 6.2.10.6</em></td>
</tr>
<tr>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3.3.2.5.2</td>
<td>6.2.10.10</td>
<td>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 6.2.10.9</td>
<td><em>SM Comment: The highlighted text is still unnecessary.</em></td>
</tr>
<tr>
<td>(2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3.3.2.6</td>
<td>6.2.10.11</td>
<td>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</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.2.10.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3.3.2.6.1</td>
<td>6.2.10.12</td>
<td>Conductors 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.</td>
<td>*SM Comment: Why is this specifically cited when Section 5.4 is cited at the beginning?</td>
</tr>
<tr>
<td></td>
<td>6.2.10.8</td>
<td></td>
<td></td>
</tr>
</tbody>
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<tbody>
<tr>
<td>6.3.3.2.7</td>
<td>6.2.10.13</td>
<td>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</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.2.10.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3.3.2.8</td>
<td>6.2.10.14</td>
<td>The emergency lighting and communications circuits shall be protected from physical damage by system vehicles or other normal system operations and from fires in the system for a period of not less than 1 hour. The circuits shall be protected from ASTM E119 fire conditions by any of the following</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.2.10.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td>(1)</td>
<td>Suitable embedment or encasement</td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>(2)</td>
<td>Routing external to the interior underground portions of the system facilities</td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>(3)</td>
<td>Diversity in system routing (such as separate redundant or multiple circuits separated by a 1-hour fire barrier) so that a single fire or emergency event will not lead to a failure of the system</td>
<td></td>
</tr>
<tr>
<td>(4)</td>
<td>(4)</td>
<td>Use of a listed fire-resistive cable system with a minimum 1-hour fire resistive rating in accordance with ANSI/UL 2196 6.3.3.2</td>
<td>The ANSI standard should be cited first, then referred back to in the next section. If the cable has a fire resistive rating, then it is fire resistive. Revised rating text to be consistent with the next section</td>
</tr>
<tr>
<td>6.3.3.2.9</td>
<td></td>
<td>Power Supply for Emergency Ventilation. See Chapter 7</td>
<td>Deleted per EKF draft since it is covered in Protection section and Chapter 7</td>
</tr>
</tbody>
</table>

130_Log 137 and Log 138_Rec_ROC_A2013
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<tr>
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<tbody>
<tr>
<td>6.3.3.2.10</td>
<td>6.2.6.2.11</td>
<td>Fire-resistive Cables used for emergency lighting and communication shall be listed and have a minimum 1-hour fire-resistive rating in accordance with 6.2.6.2.11 (4) ANSI/UL 2196 and shall be installed per the listing requirements. See above and deleted redundant text.</td>
</tr>
<tr>
<td>6.2.4</td>
<td>6.2.5</td>
<td>Fire Hazard and Engineering Analysis #133 Added</td>
</tr>
<tr>
<td>6.2.4*</td>
<td></td>
<td>Combustible Components No reason to have words in this heading but not in the next section. This section was added in 2007 edition but was really out of place in 2007 and 2010 editions.</td>
</tr>
<tr>
<td>6.2.4.1</td>
<td>6.2.5.1*</td>
<td>Where combustible materials and components not specifically addressed in this standard are installed in a trainway, a fire hazard analysis shall be conducted to determine that the level of occupant fire safety is not adversely affected by the contents. SM Comments: What specific factors are to be looked at in the fire hazard analysis?? What does this really mean and how different than 6.5.1.2? There are several specifics given for the engineering analysis.</td>
</tr>
<tr>
<td>6.2.4.2.1</td>
<td>6.2.5.2</td>
<td>An engineering analysis shall be conducted on nonstructural combustible materials and components that includes, as a minimum, an examination of peak heat release rate for combustible elements, total heat released, ignition temperatures, radiant heating view factors, and behavior of the material or component during internal or external fire scenarios to determine that, if a fire propagates beyond involving the material or component of fire origin, an equivalent level of fire safety is provided within an enclosed trainway commensurate with this standard. This is nonstructural. “Enclosed” is used here instead of “underground” or “underwater” WHY? Copy of what is in Stations chapter. So why can there not be an enclosed definition for a trainway like there is for station? What is “commensurate with this standard” mean?</td>
</tr>
</tbody>
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<tbody>
<tr>
<td>6.2.4.2.1</td>
<td>6.2.5.3</td>
<td>Computer modeling, material fire testing, or full-scale fire testing shall be conducted to assess durability performance in potential fire scenarios.</td>
<td>Durability performance of what? The “materials” and “components?”</td>
</tr>
<tr>
<td>6.2</td>
<td>6.3</td>
<td><strong>Means of Egress and Emergency Access</strong></td>
<td>Per #113 Renumber Per Construction being reordered to return to beginning of Chapter per pre 2007 version <strong>Emergency Access should remain a separate major section heading item and not be under “Protection”</strong></td>
</tr>
<tr>
<td>6.2.1</td>
<td>6.3.1</td>
<td><strong>General Location of Egress Routes</strong></td>
<td>Per #113</td>
</tr>
<tr>
<td>6.2.1.1*</td>
<td>6.3.1.1*</td>
<td>The system shall incorporate a walk surface, walkway, or other approved means of egress route for passengers to evacuate a train at any point along the trainway so that they can proceed to the nearest station or other point of safety</td>
<td>SM comment: Revise #113 to be more inclusive. Or is walking surface inherently a walkway? Track bed is inherently a walking surface if walking along the center of the rails. But walkways are for new systems, correct? What other “approved means of egress” might there be? For Disney-land monorail, a FD ladder or other cherry picker!</td>
</tr>
<tr>
<td>6.2.1.2</td>
<td></td>
<td>System egress points shall be illuminated</td>
<td>Move to “Signage, Illumination and Emergency Lighting section per #113, BUT</td>
</tr>
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<tr>
<td>6.2.2.3.2* (7) and (8)</td>
<td>6.3.1.6*</td>
<td>The system shall make provisions for evacuating passengers via the non-incident trainway, or other egress route which shall include measures to protect passengers from oncoming traffic and from other hazards, to a nearby station or other emergency exit.</td>
<td>#113 has this still under crosspassage way section. SM Comment: Combined, revised, and moved 2010 6.2.2.3.2 (7) and (8) here to be a more general statement since this is true for more than crosspasses!! (Annex note for (8) was added in 2010)</td>
</tr>
<tr>
<td>6.2.9</td>
<td>6.3.52</td>
<td>Emergency egress routes and exit facilities shall be identified and maintained to allow for their intended use.</td>
<td>SM Comment: Moved to separate section per #113. This is a general requirement statement that the #113 6.3.5 signage, illumination, and emergency lighting heading section addresses specifically.</td>
</tr>
<tr>
<td>6.3.2</td>
<td>6.3.1</td>
<td>Number and Location of Means of Egress – Location of Egress Routes</td>
<td>Per #113</td>
</tr>
<tr>
<td>6.2.1.3</td>
<td>6.3.1.1</td>
<td>Where the trainway track bed serves as the emergency egress route pathway, it shall be nominally level and free of obstructions.</td>
<td>#113 order. SM Comment: Egress pathway, route, exit, and track bed are not necessarily terms that not interchangeable in the trainway. Renumber to start section with latter since true for many systems. Add: route</td>
</tr>
<tr>
<td>6.2.1.4</td>
<td>6.3.1.1</td>
<td>Walking surfaces serving as an exit route shall have a nominally level, uniform, and slip-resistant design, and be nominally free of obstructions.</td>
<td>Per #113 SM Comment: Should be the same requirements even if they are not the same (i.e., the walking surface is not same as the trainway track bed, but is a walkway - Is the latter term defined in</td>
</tr>
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<tr>
<td>6.2.1.8</td>
<td>6.3.2.3</td>
<td>Walkway continuity shall be maintained at special track sections (e.g., crossovers, pocket tracks)</td>
<td>SM Comment: Reorder and renumber the sections below to flow better</td>
</tr>
<tr>
<td></td>
<td>6.3.1.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.3.1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2.1.5</td>
<td>6.3.2.4</td>
<td>In areas where cross-passageways (see 6.3.1.6 are provided, walkways shall be provided on the cross-passageway side of the trainway for unobstructed access to the cross-passageway</td>
<td>Per #113 SM Comment: But crosswalks and crosspassageways are NOT the same. Crosswalk could be to other route on elevated trainway.</td>
</tr>
<tr>
<td></td>
<td>6.3.1.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.3.1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2.1.6</td>
<td>6.3.1.3</td>
<td>Crosswalks shall be provided at track level to ensure walkway continuity</td>
<td>SM Comment Make list of former and #113 items below see #114</td>
</tr>
<tr>
<td></td>
<td>6.3.1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2.1.7</td>
<td></td>
<td>Be provided at track level to ensure walkway continuity</td>
<td></td>
</tr>
<tr>
<td>6.2.1.8</td>
<td>(1)</td>
<td>Crosswalks shall have uniform walking surface at the top of the rail</td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td></td>
<td>Crosswalks shall have uniform walking surface at the top of the rail</td>
<td></td>
</tr>
<tr>
<td>6.2.1.8</td>
<td>(1)</td>
<td>Walkway continuity shall be maintained at special track sections (e.g., crossovers, pocket tracks)</td>
<td>Moved to earlier location (6.3.1.2)</td>
</tr>
<tr>
<td></td>
<td>(2)</td>
<td>Walkway continuity shall be maintained at special track sections (e.g., crossovers, pocket tracks)</td>
<td></td>
</tr>
<tr>
<td>6.2.1.9*</td>
<td>6.3.2.5*</td>
<td><strong>6.3.2 Dimensions for Size of Egress Routes</strong>&lt;br&gt;The egress route means of egress within the trainway shall be provided with an unobstructed clear width graduating from the following:</td>
<td>Per #113 but. SM Comment: Revise to use Dimensions instead of Size Is this a walkway specifically or does it include other routes like the trainway track bed (which should inherently comply!)</td>
</tr>
<tr>
<td></td>
<td>6.3.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td>(1)</td>
<td>610 mm (24 in.) at the walking surface to</td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>(2)</td>
<td>760 mm (30 in.) at 1420 mm (56 in.) above the walking surface and to</td>
<td></td>
</tr>
</tbody>
</table>
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| (3) | (3) | 610 mm (24 in.) at 2025 mm (80 in.) above the walking surface |  |
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<tbody>
<tr>
<td>6.2.1.10*</td>
<td>6.3.2.6*</td>
<td>A continuous guard for raised walkways that are more than 760 mm (30 in.) above the floor or grade below shall be provided with a continuous guard to prevent falls over the open side</td>
<td>SM Comment: Check to ensure keeping * Annex note See above</td>
</tr>
<tr>
<td>6.2.1.10.1</td>
<td>6.3.2.7</td>
<td>Guards shall not be required for raised walkway:</td>
<td>SM Comment: Make list</td>
</tr>
<tr>
<td>6.2.1.10.3</td>
<td>*</td>
<td>Handrails.</td>
<td>SM Comment: still need to keep * Annex note – add to 6.3.3.8</td>
</tr>
<tr>
<td>6.2.1.11*</td>
<td>6.3.2.8*</td>
<td>A continuous handrail shall be provided for raised walkways.</td>
<td>SM Comment: Move * to this section Take another look at Annex note text?</td>
</tr>
<tr>
<td>6.2.1.11.1</td>
<td>6.3.2.9</td>
<td>A continuous handrail raised walkways shall not be required for walkways that are greater than 1120 mm (44 in.) wide and located between two trainways shall not be required to have a handrail</td>
<td></td>
</tr>
</tbody>
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<tbody>
<tr>
<td></td>
<td>6.2.1.12.</td>
<td>Passengers shall enter the trainways only in the event that it becomes necessary to evacuate a train.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.2.1.13</td>
<td>Evacuation shall take place only under the guidance and control of authorized, trained system employees or other authorized personnel as warranted under an emergency situation</td>
<td></td>
</tr>
<tr>
<td>6.2.2.2.2*</td>
<td>6.3.3.1.2*</td>
<td>Within underground, underwater, or enclosed trainways, the maximum distance between exits shall not exceed 762 m (2500 ft).</td>
<td>SM Comment: Why not underwater? This also seems out of place why is not under 6.3.2 Size-Dimension of Exit routes?</td>
</tr>
<tr>
<td>6.2.2.3</td>
<td>Cross-Passageways.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2.2.3.1*</td>
<td>6.3.3.1.3</td>
<td>Cross-passageways shall be permitted to be used in lieu of emergency exit stairways to the surface where trainways in tunnels are divided by a minimum of 2 hour–rated fire walls or where trainways are in twin bores for the following conditions</td>
<td>SM Comment: Define “tunnel” Only can use for tunnel? What about underwater, underground, and Enclosed? Added Annex note*</td>
</tr>
<tr>
<td>6.2.2.3.2*</td>
<td>Where cross-passageways are utilized in lieu of emergency exit stairways, the following shall apply</td>
<td>Repetitive text not necessary and moved * for annex note to above section</td>
<td></td>
</tr>
</tbody>
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<tbody>
<tr>
<td>(1)</td>
<td>(1)</td>
<td>Cross-passageways shall not be farther than 244 m (800 ft) apart.</td>
<td></td>
</tr>
<tr>
<td>(2)*</td>
<td>(2)*</td>
<td>Cross-passageways shall not be farther than 244 m (800 ft) from the station or tunnel portal.</td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>(3)</td>
<td>Cross-passageways shall be a minimum of 1120 mm (44 in.) in clear width and 2100 mm (7 ft) in height</td>
<td>SM Comment: Why per #113 was this just deleted from this section and not moved to be part of the Size of Egress Route section?</td>
</tr>
<tr>
<td>(4)</td>
<td>(4) (3)</td>
<td>Openings in open passageways shall be protected with fire door assemblies having a fire protection rating of 1½ hours with a self-closing fire door</td>
<td></td>
</tr>
<tr>
<td>(5)</td>
<td>(5) (4)</td>
<td>A tenable environment shall be maintained in that portion of the trainway that is not involved in an emergency and that is being used for evacuation</td>
<td></td>
</tr>
<tr>
<td>(6)</td>
<td>(6) (5)</td>
<td>A ventilation system for the contaminated tunnel shall be designed to control smoke in the vicinity of the passengers.</td>
<td>SM Comment: Delete from here and move to beginning of chapter.</td>
</tr>
<tr>
<td>(7)</td>
<td>(7) (6)</td>
<td>Provisions shall be made for evacuating passengers via the non-incident trainway to a nearby station or other emergency exit</td>
<td>Delete per above</td>
</tr>
<tr>
<td>(8)</td>
<td>(8) (7)</td>
<td>The provisions shall included measure to protect passengers from oncoming traffic and from other hazards.</td>
<td></td>
</tr>
<tr>
<td>6.2.2.4</td>
<td>6.3.3.2 6.3.3.10</td>
<td><strong>Doors</strong></td>
<td>SM Comment: Deletion of Underground (6.2.2 in 2010) for heading titles, that means all of the requirements apply to all exits (except where it says tunnels)</td>
</tr>
</tbody>
</table>

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| 6.2.2.4.1 | 6.3.3.2.1 | Doors in the means of egress, except cross-passageway doors *in enclosed trainways*, shall open in the direction of exit travel and. | SM Comment: Revised per #113 to add enclose, but still combined with old 6.3.3.2.1 text |
| 6.2.2.4.2 | 6.2.2.4.1 | Doors in the means of egress shall comply with the following | SM Comment: Delete repetitive text by combining with previous section |
| (1) | (1) | Open fully when a force not exceeding 220 N (50 lb) is applied to the latch side of the door |
| (2) | (2) | Be adequate to withstand positive and negative pressures caused by passing trains and tunnel ventilation system. |
| 6.2.2.4.3* | 6.3.3.11 | Doors in egress routes serving trainways shall have a minimum clear width of 810 mm (32 in.). |
| 6.2.2.4.4 | 6.3.3.13 | Horizontal sliding doors shall be permitted in cross-passageways. |
| 6.3.2.5 | Exit-Hatches |
| 6.3.2.5.1 | 6.3.3.13 | Exit hatches shall be permitted in the means of egress, provided the following conditions are met |
| (1) | (1) | Hatches shall be equipped with a manual opening device that can be readily opened from the egress side |
| (2) | (2) | Hatches shall be operable with not more than one releasing operation |
| (3) | (3) | The force required to open the hatch when applied at the opening device shall not exceed 130 N (30 lb). |
| (4) | (4) | The hatch shall be equipped with a hold-open device that automatically latches the door in the open position to prevent accidental closure |
| 6.3.2.5.2 | 6.3.3.14 | Exit hatches shall be capable of being opened from the discharge side to permit access by authorized personnel |
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<tbody>
<tr>
<td>6.3.2.5.2*</td>
<td>6.3.3.15*</td>
<td>Exit hatches shall be conspicuously marked on the discharge side to prevent possible blockage.</td>
<td></td>
</tr>
<tr>
<td>6.2.7</td>
<td>6.7 6X</td>
<td><strong>Blue Light Station</strong></td>
<td><strong>SM Comment: Move section to be after the signs and lighting sections (6.X) to remain as a separate section This is NOT “Protection” in the same way as detection, etc.</strong></td>
</tr>
<tr>
<td>6.3.5</td>
<td>6.3.5</td>
<td><strong>Signage, Illumination and Emergency Lighting</strong></td>
<td><strong>Added per #113. SM Comment: this combines too many things in a tangled order. Please see the order below submitted in #114. In addition, there are warning signs that are not “in” the means of egress. See other comment below.</strong></td>
</tr>
<tr>
<td>6.2.8*</td>
<td>6.4.4</td>
<td><strong>Exit Identification and Directional Signs</strong></td>
<td><strong>SM Comment: New heading:</strong></td>
</tr>
<tr>
<td>6.2.9</td>
<td></td>
<td><strong>Identification</strong> Emergency exit facilities shall be identified and maintained to allow for their intended use.</td>
<td><strong>Renumbered this to be 6.4 as a general statement general</strong></td>
</tr>
<tr>
<td>6.2.8.3</td>
<td>6.4.1</td>
<td>Signs shall be readily visible by passengers for emergency evacuation</td>
<td><strong>Moved this up since otherwise this too limited since it should apply to all emergency exits, not just directional signs</strong></td>
</tr>
<tr>
<td>Existing 2010 Section Number</td>
<td>New Section Number</td>
<td>Text</td>
<td>Comment</td>
</tr>
<tr>
<td>-----------------------------</td>
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<td>------</td>
<td>---------</td>
</tr>
<tr>
<td>6.2.8.4</td>
<td>6.4.2</td>
<td>Points of exit from elevated and underground or enclosed trainways shall be marked with internally or externally illuminated signs.</td>
<td><strong>SM COMMENT:</strong> Question: what is “point of exit?” How different from “point of egress” in renumbered 6.4.1? 101 term? Also moved this up in the order since it is more general than directional. What about underwater? This is the only one that includes elevated</td>
</tr>
<tr>
<td>6.2.8.1</td>
<td>6.4.3</td>
<td>Underground or enclosed trainways greater in length than the minimum length of one train shall be provided with directional signs as appropriate for the emergency procedures developed for the fixed guideway transit or passenger rail system in accordance with Chapter 9.</td>
<td><strong>What about underwater?</strong></td>
</tr>
<tr>
<td>6.2.8.2</td>
<td>6.4.4</td>
<td>Signs indicating station or portal directions shall be installed at maximum 25 m (82 ft) intervals on either side of the underground or enclosed trainways</td>
<td><strong>What about underwater?</strong></td>
</tr>
<tr>
<td>6.2.8.3</td>
<td>6.4.1</td>
<td>Signs shall be readily visible by passengers for emergency evacuation</td>
<td><strong>SM Comment</strong> See above renumbering - no change to text</td>
</tr>
<tr>
<td>6.2.8.4</td>
<td>6.4.5</td>
<td>Points of exit from elevated and underground or enclosed trainways shall be marked with internally or externally illuminated signs</td>
<td><strong>What about underwater?</strong> This and 6.4.2 are the only ones that include elevated</td>
</tr>
<tr>
<td>6.2.5</td>
<td>6.5</td>
<td>Illumination and Emergency Lighting</td>
<td><strong>SM Comment:</strong> Emergency Lighting was the term used historically. Changed to add “Illumination” to be separate sections in NFPA 101. Prior to 2003, this section also was only for “underground” trainways. So must be very careful!</td>
</tr>
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</table>
| 6.2.1.2                     | 6.5.1              | System **egress points** shall be illuminated. | **SM Comment Believe the order belwo as reflected in #114 numbering provides a logical order. See also comment above Re exit points**

Prior to 2007, each section underground, surface and elevated each had text “System egress points shall be illuminated” in “Egress for Passengers”

6.2-5.1 | 6.5.2 | The requirements of 6.2.5.2 through 6.2.5.3.2
6.4.2 through 6.5.3.2.2 shall apply to all underground or **enclosed** trainways that are greater than 30.5 m (100 ft) in length or 2 car lengths, whichever is greater. | Why does this not include underwater? |

6.2-5.2 | 6.5.3 | Lighting systems for **enclosed** trainways described in 6.2.5.1 shall be installed in accordance with Sections 7.8 and 7.9 of NFPA 101, except as otherwise noted in this standard. | See above |

6.2-5.2.1 | 6.5.2.3.1 | Exit lights, essential signs, and emergency lights shall be included in the emergency lighting system in accordance with NFPA 70. |

6.2-5.2.2 | 6.5.3.2.2 | Emergency fixtures, exit lights, and signs shall be wired separately from emergency distribution panels |

6.2-5.3* | 6.5.3 | Lighting systems shall be designed so that, during a period of evacuation, illumination levels of trainway walkways and walking surfaces shall not be less than 2.7 lx (0.25 ft-candles), measured along the path of egress at the walking surface |
The italics in 3rd column respond to Proposal 113, Log #152. Yellow highlight is for emphasis and to mark revision from those in Proposal 114, Log #224.

<table>
<thead>
<tr>
<th>Existing 2010 Section Number</th>
<th>New Section Number</th>
<th>Text</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2.5.3.1</td>
<td>6.5.3.1</td>
<td>The emergency lighting system in the trainway shall produce illumination on the walkway that does not exceed a uniformity ratio of 10:1 for the maximum maintained horizontal illuminance to the minimum maintained horizontal illuminance.</td>
<td></td>
</tr>
<tr>
<td>6.2.5.3.2</td>
<td>6.5.3.2</td>
<td>Point illumination of means of egress elements shall be permitted to exceed the 10:1 uniformity ratio.</td>
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</tr>
<tr>
<td>6.2.5.3.2</td>
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<td>Point illumination of means of egress elements shall be permitted to exceed the 10:1 uniformity ratio.</td>
<td></td>
</tr>
<tr>
<td>6.2.3</td>
<td>6.6</td>
<td>Surface and Elevated Emergency Access</td>
<td>SM Comment: This section was historically only for surface and elevated trainways. Do NOT agree with #113 move all these sections to Protection System section? But only renumber them below as in #114</td>
</tr>
<tr>
<td></td>
<td>6.6.1</td>
<td>Except as described herein, exits from the trainway, shall serve as emergency access routes</td>
<td>Text per #113</td>
</tr>
<tr>
<td>6.2.3.1</td>
<td>6.6.2</td>
<td>Surface</td>
<td>Renumber sections</td>
</tr>
<tr>
<td>6.2.3.1.1</td>
<td>6.6.2.1</td>
<td></td>
<td></td>
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<tr>
<td>6.2.3.1.2</td>
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<td>6.2.3.1.3</td>
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<td>6.2.3.1.4</td>
<td>6.6.2.4</td>
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<tr>
<td>6.2.3.2</td>
<td>6.6.3</td>
<td>Elevated</td>
<td>Renumber sections</td>
</tr>
<tr>
<td>6.2.3.2.1</td>
<td>6.6.3.1</td>
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<td>6.2.3.2.2</td>
<td>6.6.3.2</td>
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<td>6.2.3.2.3</td>
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<tr>
<td>6.2.3.2.4</td>
<td>6.6.3.4</td>
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</tr>
</thead>
<tbody>
<tr>
<td>6.2.7</td>
<td>6.5</td>
<td>Blue Light Station</td>
<td>SM Comment: Renumber but Do NOT agree with #113 move this to Protection section. Should be kept separate as historically done</td>
</tr>
<tr>
<td></td>
<td>6.4.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.5</td>
<td>6.6</td>
<td>Traction Power</td>
<td>Per #113 this was moved to be part of Means of Egress. SM Comment: Reconsider</td>
</tr>
<tr>
<td></td>
<td>6.3.4</td>
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<td>6.X</td>
<td></td>
<td></td>
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<tr>
<td>6.5</td>
<td>6.7</td>
<td>Protection</td>
<td>SM Comment: Per #113 with exception of Moving Emergency Access to this section. Revise all numbering of this section to reflect change in numbering</td>
</tr>
<tr>
<td>6.3.3.2.1</td>
<td>6.7.xa</td>
<td>Emergency Power</td>
<td>SM Comment: Move per #113 but insert before Portable Fire Extinguishers section</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3.2</td>
<td>6.7.x</td>
<td>Ventilation</td>
<td>SM Comment: Move per #113 but insert after proposed moving of Emergency Power section and before portable fire extinguishers – see above.</td>
</tr>
</tbody>
</table>
Stephanie H. Markos, US Department of Transportation

130-114

I have provided a copy of Chapter 6 for this proposal which includes my reasoning for the reordering of contained in this proposal which was provided to the Task Group.

Continue to believe, that due to the time constraints from the necessity to review so other many specific technical proposals for the Stations and Trainway chapters, neither the Task Group nor the Committee was able to meaningfully evaluate either the revisions proposed in this Proposal or Proposal 113. Believe that the consolidation from X sections to X sections is unnecessary and has also caused the new application of unintended, more stringent requirements for unenclosed trainways.

Stephanie H. Markos, US Department of Transportation

130-115

As noted in the proposal, this issue is not just for Chapter 6. Please see the proposed revisions for sections of Chapter 1, 3, 5, 6, 7, 8, 9, and sections of Annexes A, B, C, and D, to clarify the terms "underwater," "underground," tunnels, and "enclosed," as contained in Mr. Locke’s Proposal vote comments. In addition, Mr. Locke includes other specific related revisions.

This is the second cycle that I have identified the consistency issues and confusing unclear reasons for the different usage of "enclosed," "elevated" as well, as "underground," and "underwater" throughout Chapter 6. See my detailed specific items listed in my Proposal and Negative proposal vote comments.

Mr. Locke and Mr. Middlebrook also agreed by voting Negative with comments on the Rejection of this proposal.

Stephanie H. Markos, US Department of Transportation

130-128

Revised text in proposal to say: blue lights at blue light stations

Blue lights have historically been applied to "blue light stations" operable only by emergency service or other authorized personnel. I do not understand why the "lights," whatever the color (I have understood that there has been a common agreement that the lights may not be in fact "blue," but may be another color), which ARE intended to show the location of the "blue light station" would not be on the emergency power systems, since they are locations that have traction power cut off, and means for communication, which should also be required (and are?) to be on the emergency power system. Moreover, that distinction of usage by "emergency service or other authorized personnel" as stated in the Committee statement has been broken by the Committee acceptance of Proposal 130-20, which deletes that phrase!
130- Log #82
(6.2.1.6)

**Final Action:**

**Submitter:** Harold A. Locke, Locke & Locke Inc.

**Comment on Proposal No:** 130-118

**Recommendation:** Revise text to read as follows:

6.2.1.6 Crosswalks shall be provided at track level to ensure walkway continuity. "Walkway continuity shall be provided by crosswalks at track level."

**Substantiation:** The revised wording eliminates redundancy.

130- Log #56
(6.2.2.4 and A.6.2.2.4 (New) )

**Final Action:**

**Submitter:** Robert Montfort, New York City Transit Authority

**Comment on Proposal No:** 130-21

**Recommendation:** The committee accepted in principle the use of pivot doors for stations in this proposal. Recommend the committee also allow the use of pivot doors for cross passageways by adding a similar annex note to 6.2.2.4 as follows:

A.6.2.2.4 Butterfly doors may be permitted in cross passageways. See A.5.5.6.3.4 for door criteria.

**Substantiation:** Since a reason used to justified the addition of butterfly doors to the Standard is air pressure equalization, butterfly doors should also be permitted in tunnel cross passageways. There is likely to be a much greater pressure difference in trainways when emergency fans are operating than in stations. Train evacuations are more orderly than station evacuations, generally single file, and train operating personnel will more than likely open the cross passageway butterfly doors. Even if the use of these doors in the stations is ultimately rejected based upon the negative comment by Casselman, their use should still be permitted in the tunnel. Cross passage doors are problematic in that hinged doors are dangerous given train piston effect or emergency fan air pressure and could be difficult to open. Sliding doors take a much larger area given the dead space to permit the door to slide out of the way. The butterfly door minimizes these issues but of course still requires maintenance to the same level of sliding doors.

130- Log #99
(6.2.3 (New) )

**Final Action:**

**Submitter:** Katherine Fagerlund, Sereca Fire Consulting Ltd.

**Comment on Proposal No:** 130-127

**Recommendation:** Revise text to read as follows:

6.2.3 Egress and Emergency Access for Open Cut Trainways

6.3.1.8 6.2.3.1 For open cut trainways, an engineering analysis shall be conducted to evaluate the impact of the trainway configuration on safe egress from a train fire to a point of safety.

6.3.1.9 6.2.3.2 Where the engineering analysis indicates that the configuration will impact tenability beyond the immediate vicinity of the fire, egress routes shall be provided such that the maximum distance from any point within the open-cut section to a point of egress from the trainway shall not be more than 381 m (1250 ft.).

6.4.1.8 6.2.3.3 Where the configuration of an open cut trainway prevents or impedes access for firefighting, provisions shall be made to permit firefighter access to that section of trainway at intervals not exceeding 762 m.

**Substantiation:** Revised to move egress criteria to egress section and to properly locate emergency access requirements in the reorganized Chapter 6.
130- Log #98  Final Action:
(6.2.6.1)

Submitter: Katherine Fagerlund, Sereca Fire Consulting Ltd.
Comment on Proposal No: 130-113
Recommendation: Revise text to read as follows:
6.1.2.3* 6.2.6.1 Warning signs in accordance with 6.3.5.1 shall be posted on entrances to the trainway (e.g., station platforms and portals), on fences or barriers adjacent to the trainway, and at such other places where nontransit authority employees might trespass at locations where non-authorized personnel may trespass.
A 6.1.2.3 Locations requiring such signage may include: entrances to the trainway (e.g., station platforms and portals) and fences or barriers adjacent to the trainway.
The above proposal is not intended to apply to the version of Section 6.2.6.1 that appears as 6.3.5.1 under the heading 6.3.5 Signage Illumination and Emergency Lighting.
Substantiation: Revised to move language that provides elaboration on the basic criteria to Annex A.

130- Log #18  Final Action:
(6.2.7)

Submitter: John Nelsen, Seattle Fire Department
Comment on Proposal No: 130-17
Recommendation: Delete text to read as follows:
6.2.7 Blue Light Station:
6.2.7.1* Blue light stations shall be provided at the following locations:
(1) At the ends of station platforms
(2) At cross-passageways (see Section 6.2.2.3)
(3) At emergency access points
(4) At traction power substations
(5) In underground trainways as approved
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 were 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:

130- Log #102  Final Action:
(6.3.3)

Submitter: Katherine Fagerlund, Sereca Fire Consulting Ltd.
Comment on Proposal No: 130-209
Recommendation: Revise text to read as follows:
6.3.3 Wiring Requirements: 6.2.9 Wires and Cables. Wires and cables used in trainways shall provide resistance to fire and the generation of smoke in accordance with the requirements of Chapter 12.
Substantiation: Proposed revisions provide cross-reference to applicable requirements that will be contained in the new chapter addressing requirements for wires and cables. This is consistent with cross-references that are provided elsewhere in the standard (e.g., in Chapters 5 and 6 to emergency ventilation requirements in Chapter 7). The proposed numbering is consistent with the Chapter 6 re-organization proposed in ROP 130-113 Log #152.
130- Log #155
(6.3.3.2.6 (New) )

Final Action:

Submitter: James Conrad, RSCC
Comment on Proposal No: 130-132
Recommendation: Add new text to read as follows:
6.3.3.2.6 All wires and cables used for enclosed stations and trainways shall emit less than 2 percent acid gas when tested in accordance with MIL-DTL-24643.
Renumber subsequent sections.
Substantiation: In addition to acid gasses being a known eye irritant and respiratory inhibitor it can also cause the failure of electrical equipment. The committees comment that this surpasses the current minimum standard and accepted practice is not a reason for rejects. This is a life safety standard and by adding an acid gas test to it increases the safety of the critical electrical systems that this standard requires to function during a fire emergency.

130- Log #103
(6.3.3.3 (New) )

Final Action:

Submitter: Katherine Fagerlund, Sereca Fire Consulting Ltd.
Comment on Proposal No: 130-209
Recommendation: Revise text to read as follows:
6.4.8 Circuit Protection. 6.3.3.3 The emergency power, lighting and communications circuits shall be protected from physical damage by system vehicles or other normal system operations and from fire as described in Section 12.4.3.
Substantiation: In the proposal, this is part of a section addressing only emergency power circuits, whereas the wording refers to other types of circuits as well and therefore requires a separate section.

130- Log #68
(6.5.2.x (New) )

Final Action:

Submitter: Robert Montfort, New York City Transit Authority
Comment on Proposal No: 130-138
Recommendation: The committee substantiation statement for the rejection of this proposal “that this is a design requirement of NFPA 14” is not valid as the sole reason for rejection. Recommend the substantiation statement be revised to state:
“The proposal as written does not provide any additional clarify to the requirements and therefore, the technical committee did not agree to modify the requirement.”
Substantiation: NFPA 14 should not be the sole reason for rejecting a proposal. There are many areas in NFPA 130 where another NFPA Standard, including NFPA 14, are referenced and also includes the statement, “except as modified herein”. These referenced standards may not adequately address transit stations and tunnels, and do not always take into account all associated issues.
The committee substantiation statement does not apply to the proposal. In that it is not clear why rejection action was taken, it is recommend the following new text which was proposed and submitted by Thomas G. Middlebrook be accepted.

6.5.2.1 An approved fire standpipe system shall be provided in underground fixed guideway transit or passenger rail system trainways where physical factors prevent or impede access to the water supply or fire apparatus, where required by the authority having jurisdiction.

The committee substantiation statement rejects this proposal because the original language implies testing and inspection by the AHJ. Section 6.5.2.1 references NFPA 14 and NFPA 14 includes standpipe testing and inspection requirements. The proposal simply wants to eliminate “An Approved” which is redundant since the NFPA 14 requires approval of all standpipes by the AHJ.

Recommend the following new text which was proposed and submitted by Katherine Fagerlund be accepted.

Standpipes shall be permitted to be of the dry type with the approval of the authority having jurisdiction provided the following conditions are met:

1. Systems shall be installed in a manner so that the water is delivered to all hose connections on the system in 10 minutes or less.

2. Combination air relief–vacuum valves shall be installed at each high point on the system.

Calculations, including transit and fill times, should be submitted to the authority having jurisdiction to support this requirement.

Dry standpipe systems are a necessity for tunnels in cold climates. Wet systems would require extensive heat tracing which would be expensive and difficult to maintain. Applying NFPA 14 requirements for filling time would be too onerous and make the installation of dry standpipe systems in tunnels impractical. Considering the time it takes fire fighters to suit up, get their gear, descend into the system and verify third rail power shutoff, the 10 minute requirement in NFPA 502 to deliver water to all hose valves is not unreasonable. The use of air relief valves is also a worthwhile requirement since they can significantly reduce the time to fill the standpipe. It should be noted that NYCT has many dry standpipes installed and FDNY has never indicated a problem with a ten minute fill time.

NFPA 14 should not be the sole reason for rejecting a proposal. The Standard recognizes in paragraph 5.7.4.1 that not all the requirements contained in NFPA 14 can be applied to transit stations and tunnels by stating “except as modified herein.” NFPA 130 should modify other NFPA standards, in this case NFPA 14 as required to insure their applicability to transit systems.
The committee substantiation statement for the rejection of this proposal “that this is a design requirement of NFPA 14” is not valid as the sole reason for rejection. Recommend the substantiation statement be revised to state:

“The proposal as written does not provide any additional clarify to the requirements. In addition, the proposed Annex material does not appear to be aligned to requirements in the base document. Also, if two independent separated north and south bound tunnels each have standpipe systems that meet the specified requirements then there is no basis to require additional fill time because of a cross connection all based upon the single event assumption. For these reasons, the technical committee did not agree to modify the requirement.”

NFPA 14 should not be the sole reason for rejecting a proposal. There are many areas in NFPA 130 where another NFPA Standard, including NFPA 14, are referenced and also includes the statement, “except as modified herein”. These referenced standards may not adequately address transit stations and tunnels, and do not always take into account all associated issues. The proposed substantiation provides a more detail basis for the rejection.
*7.x Testing

*7.x.1 Fans, dampers and air flow control devices Equipment used for emergency ventilation (including fans, dampers, and air flow control devices) shall be listed for the application or shall be approved by the AHJ in accordance with the requirements of a recognized standard for the type of equipment to be installed. Be factory tested.

*7.x.2 The no-fire (or cold) airflows provided by the installed mechanical ventilation system shall be measured during commissioning to confirm that the airflows meet the requirements determined by the analysis.

A.7.x.1 Factory Approval Testing

(1) Ventilation equipment should comply with all the requirements of one of the applicable standards for the equipment in question. The applicable standards are be factory-tested using accepted standards such as those published by the Air Movement and Control Association, the American Society of Heating, Refrigerating and Air-Conditioning Engineers, the International Standards Organization for Standardization or UL (formerly, and the Underwriters Laboratories). If an appropriate standard does not exist then a test procedure should be submitted for approval by the AHJ.

(2) Factory Approval tests may consist of prototype testing or of production testing. Prototype testing should include those tests necessary to ensure that the design of the equipment is acceptable, including tests for design temperature exposure time. Typically one prototype is thoroughly tested. Production testing should include those tests necessary to ensure that the equipment as produced meets the requirements of the standard specification. Typically all equipment produced is production tested.

A.7.x.2 Commissioning Tests

A Test Plan should be prepared and submitted to the owner and the AHJ for review and approval prior to the commissioning tests. The Test Plan should describe the method of testing and identify pass-fail criteria. As a minimum, the Test Plan should identify the following items:

(1) The commissioning tests should include individual equipment tests (as indicated in 2 and 3) and system-wide tests (as indicated in 4-13).

(2) The individual fans, dampers and other devices should be operated to confirm their functionality. As a minimum, ventilation equipment operation should be initiated at the local primary location for fan operation such as an emergency management panel or fire management panel.

(3) The individual fan and ventilation plant airflows should be measured to confirm the intended airflows are being delivered. At least one test should be made to measure the time required for the fan plant airflows to reach steady state from a zero-flow start and at least one test should be made to measure the time required for the fan plant airflows to reverse from full-forward to full-reverse operation. Subsequent tests should be conducted from Operations Central Control to verify remote fan and damper operation.

(4) The no-fire (or cold) station and tunnel airflows provided by the as built mechanical ventilation system should be measured to confirm that the airflows meet the requirements determined by the analysis.

(5) The Test Plan should include provisions for the witnessing of the system wide tests by the owner, the AHJ, the designer or the engineer of record, the contractor, and possibly the ventilation equipment suppliers.

(6) The system-wide testing should be done by a qualified airflow measurement specialist or contractor having previous experience in measuring airflows.

(7) Calibrated instruments providing an air velocity measurement accuracy of ± 2.5% should be used. The number of points to be measured to convert air velocities to airflows should be determined either by the applicable standard used for the approval testing, by standards such as those published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, the Air Movement and Control Association, the American Society of Heating, Refrigerating and Air-Conditioning Engineers, the International Organization for Standardization or UL, or by a CFD analysis. The test data should be electronically recorded for future use.

(8) The Test Plan should identify the fan(s) that are assumed to be operated and not operated by the analysis for each scenario being tested.

(9) The Test Plan should include at least one test to measure the time required for all the fans used in a fire scenario to
reach full operating mode.

(10) The Test Plan should include the tunnel fire scenarios to be assessed tested. These should include the design cases (i.e., those that determine the ventilation equipment functional capacities) and any other scenarios deemed appropriate. The train(s) should be located in the tunnel as per the scenario. Tunnel airflows upstream of the stopped trains should be measured. It is not necessary to test all scenarios.

(11) The Test Plan should also include the station fire scenarios to be assessed tested. These should include the design cases (i.e., those that determine the ventilation equipment functional capacities) and any other scenarios deemed appropriate. The station geometry may preclude the necessity of locating trains in the station. Airflows through the station entrances and tunnels connected to the station should be measured. It is not necessary to test all scenarios.

(12) The airflows measured should be compared with the "cold flows" predicted by the analysis. If the measured airflows are less than the predicted airflows then the mechanical ventilation system or its operation should be changed and the test repeated until passing results are achieved. Negative tolerances in the results should not be accepted.

(13) The system-wide testing should be documented by one or more reports. The report should include a description of the scenario tested, the instrumentation used, the names and affiliations of those witnessing the tests, and all test results.

Also renumber sections that follow.

Substantiation: Factory testing is an unenforceable and meaningless statement. Every manufacturer will always claim that equipment provided is “factory tested”. The key issue is that the equipment shall have been tested to the applicable standard and that the test results are in compliance with the appropriate standard. One way of doing that is by having a listing organization confirm that the equipment has been listed to the applicable standard. The other way is by having the authority having jurisdiction approve the equipment based on results presented by the manufacturer or an authorized representative.

All the other changes proposed are primarily editorial, and include the correct names of the organizations and consistency between the sections.

There is no need to tell in the standard what a manufacturer should do regarding the number of tests to conduct for either prototype or production testing; that is the manufacturer’s prerogative.

130- Log #141 (7.1.1.2 and A.7.1.2.2) Final Action:

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-152
Recommendation: The word fixed guideway should be added before the 4 instances of the word "transit." Revise capital P in two places to be lower case.

Substantiation: Per previous agreement as to usage of terms and editorial.
The engineering analysis of the ventilation system shall include a validated subway analytical simulation program augmented as appropriate by a quantitative analysis of airflow dynamics produced in the fire scenario, such as would result from the application of validated computational fluid dynamics (CFD) techniques. The results of the analysis shall include the no-fire (or cold) air velocities—that can be measured during commissioning to confirm that a mechanical ventilation system as built meets the requirements determined by the analysis.

Add the following after Section 7.4.4:

7.x Testing

*7.x.1 Fans, dampers and devices used for emergency ventilation shall be factory tested.

*7.x.2 The no-fire (or cold) airflows provided by the installed mechanical ventilation system shall be measured during commissioning to confirm that the airflows meet the requirements determined by the analysis.

Add the following after Section A.7.x.x in Annex A:

A.7.x.1 Factory Testing.

1. Ventilation equipment should be factory-tested using accepted standards such as those published by the Air Moving and Control Association, the American Society of Heating Refrigerating and Air-Conditioning Engineers, the International Standards Organization, and the Underwriters Laboratory. If an appropriate standard does not exist then a test procedure should be submitted for approval.

2. Factory tests may consist of prototype testing and production testing. Prototype testing should include those tests necessary to assure the design of the equipment is acceptable. Typically one prototype is thoroughly tested. Production testing should include those tests necessary to assure the equipment as produced meets specification. Typically all equipment produced is production tested.

A.7.x.2 Commissioning Tests

A Test Plan should be prepared and submitted to the owner and the AHJ for review and approval prior to the commissioning tests. The Test Plan should describe the method of testing and identify pass-fail criteria. As a minimum, the Test Plan should identify the following items:

1. The commissioning tests should include individual equipment tests (2 and 3) and system-wide tests (4-13).

2. The individual fans, dampers and other devices should be operated to confirm their functionality. As a minimum, ventilation equipment operation should be initiated at the local primary location for fan operation such as an emergency management panel or fire management panel.

3. The individual fan and ventilation plant airflows should be measured to confirm the intended airflows are being delivered. At least one test should be made to measure the time required for the fan plant airflows to reach steady-state from a zero-flow start and at least one test shall be made to measure the time required for the fan plant airflows to reverse from full-forward to full-reverse operation. Subsequent tests shall be conducted from Operations Central Control to verify remote fan and damper operation.

4. The no-fire (or cold) station and tunnel airflows provided by the as built mechanical ventilation system should be measured to confirm that the airflows meet the requirements determined by the analysis.

5. The Test Plan should include provisions for the witnessing of the system-wide tests by the owner, the AHJ, the designer or the engineer of record, the contractor, and possibly the ventilation equipment suppliers.

6. The system-wide testing should be done by a qualified airflow measurement specialist or contractor having previous experience in measuring airflows.

7. Calibrated instruments providing an air velocity measurement accuracy of ± 2.5% should be used. The number of points to be measured to convert air velocities to airflows should be determined by standards such as those published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, the Air Moving and Control Association or a CFD analysis. The test data should be electronically recorded for future use.

8. The Test Plan should identify the fan(s) that are assumed to be operated and not operated by the analysis for each scenario being tested.

9. The Test Plan should include at least one test to measure the time required for all the fans used in a fire scenario to reach full operating mode.

10. The Test Plan should include the tunnel fire scenarios to be tested. These should include the design cases (i.e., those that determine the ventilation equipment functional capacities) and any other scenarios deemed appropriate. The
train(s) should be located in the tunnel as per the scenario. Tunnel airflows upstream of the stopped trains should be measured. It is not necessary to test all scenarios.

(11) The Test Plan should include the station fire scenarios to be tested. These should include the design cases (i.e., those that determine the ventilation equipment functional capacities) and any other scenarios deemed appropriate. The station geometry may preclude the necessity of locating trains in the station. Airflows through the station entrances and tunnels connected to the station should be measured. It is not necessary to test all scenarios.

(12) The airflows measured should be compared with the “cold flows” predicted by the analysis. If the measured airflows are less than the predicted airflows then the mechanical ventilation system or its operation should be changed and the test repeated until passing results are achieved. Negative tolerances in the results should not be accepted.

(13) The system-wide testing should be documented by one or more reports. The report should include a description of the scenario tested, the instrumentation used, the names and affiliations of those witnessing the tests, and all test results.

Substantiation: Add testing requirements to assure ventilation system performs as intended.

This is not original material; its reference/source is as follows: William D. Kennedy's ROP #98.

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<th>130- Log #142</th>
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Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-154
Recommendation: Reject proposed accepted text in section 7.2 and Accept proposed text of A.7.2.1. Accept that text be revised to move asterisk for new annex note to apply only to 7.2.1(3).

Substantiation: Agree with Ms. Reed Tanaka's and Mr. Monfort's comments.

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Submitter: Robert Montfort, New York City Transit Authority
Comment on Proposal No: 130-154
Recommendation: I concur with Ms Tanaka’s negative comment on the proposal and recommend that the existing text remain and only a new Annex Note be applied to 7.2.1(3) as follows:

7.2.1
(3) Be capable of reaching full operational mode within 180 seconds.

A.7.2.1.(3) The time frame required for achievement of the selected operating mode applies to the ventilation system equipment and not to the establishment of the resultant air flows in the tunnels and stations. This would be the time for the emergency ventilation system to achieve the required speed and direction for all related fans and reach the required position for all dampers and related emergency devices.

Substantiation: The proposed wording provides greater clarity in the meaning of the 180 seconds then was provided by the original proposal which was accepted by the Committee. It also addresses the negative comment that was provided.
Final Action:

Submitter: Robert Montfort, New York City Transit Authority
Comment on Proposal No: 130-158

Recommendation: The committee action did not correct the typo in both paragraphs as they still refer to “7.2 3(6)” instead of “7.2.3(7)”. Committee action should be corrected as follows:

7.2.4 Criteria for the system reliability analysis in 7.2.3(67) shall be established and approved.
7.7.1.1. Alternatively, the design of the power for the emergency ventilation system shall be permitted to be based upon the results of the electrical reliability analysis as per 7.2.3(67), as approved.

Substantiation: The reference to 7.2.3(6) is incorrect as indicated in the substantiation. It appears that these are just ROP typo’s and that NFPA staff may have automatically corrected this, but I thought that the document should be suitability corrected.

Final Action:

Submitter: Robert Montfort, New York City Transit Authority
Comment on Proposal No: 130-22

Recommendation: The acceptance of this proposal changes the title of Section 7.4 from Devices to Air Control Devices. As a result, paragraph 7.4.4 was eliminated and ventilation plenums moved to new paragraph 7.2.7, but the provision that the dampers not be required to have a fire rating was removed. Recommend adding new 7.3.2.2 as follows:

7.3.2.2 Dampers that serve more than one trainway from a common plenum or duct system shall not be required to have a fire rating.

Substantiation: There are numerous locations where emergency ventilation fans serve more than one trainway. In order to accomplish this, dampers must be placed in the fan plant common walls with the trainways and the fan plant used as a plenum. Trainways using cross passageways are required to have a minimum 2 hour fire rating. For this system to operate properly, the dampers cannot be fire rated. Removing paragraph 7.4.4 eliminates that the dampers in this situation do not have to be fire rated where they may be a fire rated boundary between trainways. This was added to the 2010 edition of the standard as a clarification.

Final Action:

Submitter: Marcelo M. Hirschler, GBH International
Comment on Proposal No: 130-163

Recommendation: Revise text to read as follows:

7.4.2 Devices in the emergency ventilation system that are exposed to the exhaust airflow and are critical to its effective functioning in the event of an emergency shall be constructed of materials suitable for operation designed to operate in an ambient atmosphere of 250°C (482°F) for a minimum of 1 hour but not less than the required time of tenability.

Substantiation: The issue is not what the materials were designed to do but whether they are suitable for operation under the conditions they need to operate. It is possible to design materials for many applications and fail in the design resulting in materials that are not suitable.
130- Log #74

Final Action:

Submitter: Robert Montfort, New York City Transit Authority
Comment on Proposal No: 130-161

Recommendation: Since the committee accepted the proposed changes to 7.3.2 and section 7.4.2 is related, it should also be modified as follows:

7.4.2 Devices in the emergency ventilation system that are exposed to the exhaust airflow and are critical to its effective functioning in the event of an emergency shall be constructed of non-combustible, fire-resistant materials and shall be designed to operate in an ambient atmosphere at the design temperature as determined under 7.3.2 of 250 degrees C (482 degrees F) for a minimum of 1 hour but not less than the required time of tenability.

7.4.2.1 A design analysis shall be permitted to be used to reduce this temperature; however, the temperature shall not be less than 150 degrees C (302 degrees F).

7.4.2.2 Finishes applied to noncombustible devices shall not be required to meet the provisions of 7.4.2.

Substantiation: 7.3.2 and 7.4.2 are related sections and both refer to required design temperatures for emergency ventilation equipment. To be consistent, both sections should have the same wording; however, by referring 7.4.2 back to 7.3.2 to determine the temperature is less likely to create inconsistency in future editions since there is only one section that defines how to determine the temperature.

See negative comment by Susan Reed Tanaka under proposal 130-154 (Log 107)

130- Log #163

(7.7 and 7.7.1.2)

Final Action:

Submitter: Robert Montfort, New York City Transit Authority
Comment on Proposal No: 130-209

Recommendation: Revise text to read as follows:

7.7 Emergency Power and Wiring

7.7.4.2 The emergency ventilation...

Substantiation: Under the subject proposal, "Emergency" was added to the title and the words "and wiring" were deleted. These words should be replaced. The section contains both requirements for power and emergency power. Existing Section 7.7.1.1 discusses an alternate wiring power" design. In addition existing Section 7.7.1.2 discusses wiring methods and not power and therefore should be under Section 7.7.2.

130- Log #156

(7.7.7 (New) )

Final Action:

Submitter: James Conrad, RSCC
Comment on Proposal No: 130-168

Recommendation: Add new text to read as follows:

7.7.7 All wires and cables used for enclosed stations and trainways shall emit less than 2 percent acid gas when tested in accordance with MIL-DTL-24643.

Substantiation: In addition to acid gasses being a known eye irritant and respiratory inhibitor it can also cause the failure of electrical equipment. The committees comment that this surpasses the current minimum standard and accepted practice is not a reason for rejects. This is a life safety standard and by adding an acid gas test to it increases the safety of the critical electrical systems that this standard requires to function during a fire emergency.
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**Submitter:** Kevin Cheong, Applied Engineering Solutions Ltd.  
**Comment on Proposal No:** 130-46  
**Recommendation:** Revise text to read as follows: 
- building emergency fire command center  
**Substantiation:** Under definitions there is a “Command Post” a “Fire Command Center” and a “Local Control”, but no building emergency command center. While the term “emergency command center” appears to have been borrowed from NFPA 72, there it is used in the context of mass notification communication. The term building is generally used as verb in NFPA 130, not a noun.

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**Submitter:** Marcelo M. Hirschler, GBH International  
**Comment on Proposal No:** 130-176  
**Recommendation:** Continue rejecting proposal.  
**Substantiation:** As the committee states in the ROP, the methodology is proprietary. Furthermore, the methodology is not published anywhere and tests can be conducted only in a single laboratory.

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**Submitter:** Stephanie H. Markos, US Department of Transportation  
**Comment on Proposal No:** 130-175  
**Recommendation:** Delete addition of Note b to Category floor covering and elastomers.  
**Substantiation:** This note was applied, as stated in substantiation to all materials except floor covering and elastomers. Wire and cable is also an exception. I continue to disagree with this proposal, as I did during review of this proposal while a member of Task Group 4. I continue to believe that application of Note 2 to elastomers and floor coverings is not necessary for the sole stated purpose of “consistency.” To my knowledge, Task Force 4 members were not provided any material data that show that those type or materials meet Note 2.

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**Submitter:** Stephanie H. Markos, US Department of Transportation  
**Comment on Proposal No:** 130-177  
**Recommendation:** See comment for Proposal 179.  
**Substantiation:** See comment for Proposal 179.

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**Submitter:** Stephanie H. Markos, US Department of Transportation  
**Comment on Proposal No:** 130-178  
**Recommendation:** See comment for proposal 179.  
**Substantiation:** See comment for proposal 179.
Stephanie H. Markos, US Department of Transportation

130-179
Delete addition of new function of material Adhesives and Sealants and new test requirements to this table.

Substantiation: During the Task Force 4 review, I questioned this proposal and include here the following same comments provided to the Task Force: The ASTM E 162 and 662 tests are not necessarily the correct tests to use, without further explanation or guidance on how the adhesives and sealant should actually be tested, separately or as part of the component if a composite. If tested as part of composite component, consisting of materials on the “top” layer exposed to test flame source, which already meet ASTM E 162 and 662 criteria or other tests and criteria, how does the fire performance of the adhesives or sealants reflect anything meaningful since it is not exposed? The technical basis provided is not appropriate.

130-190
For Annex note: Add fixed guideway before “transit” and passenger rail before “authorities.”

Substantiation: To clarify as agreed for consistency of language and application in previous cycles.

130-197
Deleted text in this accepted proposal should not be deleted.
Substantiation: During the Task Force 4 review of this proposal to delete the mention the option of mentioning the AHJ or the following criteria: Continue to believe that depending on the local operating environment, the AHJ should be mentioned as determining the necessary level of illumination for emergency lighting.
A communication system shall be established in accordance with this chapter.

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:

Wherever necessary for reliable communications, a separate radio network capable of two-way radio communication for fire department personnel to the fire department communication center shall be provided.

10.3.2 Underground and enclosed stations and trainways shall be provided with a public safety radio enhancement system network conforming with NFPA 72, National Fire Alarm and Signaling Code.

10.3.3 A radio network shall comprise base transmitters and receivers, antennas, mobile transmitters and receivers, portable transmitters and receivers, and ancillary equipment.

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:
A two-way, wired emergency services communication system (ETEL) shall be provided for fire department use. This system shall be in accordance with NFPA 72, National Fire Alarm and Signaling Code. (For two-way communication requirements for vehicles, see Section 8.9.2.)

The ETEL system shall be permitted to be used for signaling and communications for reporting a fire and other emergencies in lieu of manual fire alarm boxes (e.g., voice call box service).

The system shall have a telephone network of fixed telephone lines and handsets capable of communication with all stations, fire command centers, structures, offices, power stations and substations, control towers, ancillary rooms and spaces, and locations along the trainway in accordance with NFPA 72.

At least one ETEL station or jack shall be provided at the following locations:

1. Each floor level
2. Each notification zone
3. Each elevator cab
4. Elevator lobbies
5. Elevator machine room(s)
6. Emergency and standby power room(s)
7. Fire pump room(s)
8. Area(s) of refuge
9. Each floor level inside an enclosed exit stair(s)
10. Emergency command center, where provided
11. Operations control center
12. Traction power substations
13. Blue light station locations
14. Other locations along the trainway deemed necessary by the authority having jurisdiction
15. Ancillary rooms and spaces
16. Other room(s) or area(s) as required by the authority having jurisdiction

The location and spacing of telephones along the trainway shall be determined by the authority having jurisdiction.

Telephones along the trainway shall have distinctive signs or lights or both for identification.

Telephones located shall be automatically identified in the OCC or other approved location.

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:

John Nelsen, Seattle Fire Department

Revise text to read as follows:

130-8 Log #26

10.5 Portable Telephones and Lines -

10.5.1 The authority shall maintain portable communications equipment and arrange for the dispatch to an emergency scene where required for emergency operations or requested by emergency responders.

10.5.2 The authority having jurisdiction shall approve the type of communications equipment.

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:


John Nelsen, Seattle Fire Department

Revise text to read as follows:

130-8 Log #26

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.
Delete text as follows:

11.3.3* In addition to physical protection from incidents, the method of routing and providing protection to fire-life safety critical copper and fiber data communication cables and related components shall consider the temperature rating of the cable and other transmission related equipment.

A.11.3.3 Typically, fiber optic strands experience excessive attenuation at temperatures exceeding approximately 158°F (70 °C), and the fiber ceases to convey signal. It is essential to the continued fire-life safety system function during an emergency that the communication system design considers the thermal insulation performance of fire resistance rated separations for related components and of the embedment for copper and fiber data communication cables. Where the thermal protection provided by embedment is insufficient for the design fire heat exposure, other means should be employed to maintain conditions within the thermal limits of the system cables and components.

This proposal presents incorrect information, is misleading and is unenforceable.

1. Optical fiber cables are listed by UL to UL 1651 (Standard for Optical Fiber Cable), a standard that does not contain a specification for a temperature rating. Therefore listed optical fiber cables do not have a required temperature rating and would automatically be prohibited from use in any application in the control and communication system, if the section were to be attempted to be enforced.

2. For Bellcore’s GR-20 (Generic Requirements for Optical Fiber and Optical Fiber Cable) standard, optical fiber cables are assessed for aging at 85°C for 168 hours as well as for aging with cycling of up to 70°C and down to -40°C several times.

3. Searching the web it is pretty easy to find optical fiber cables that are designed to be used at high temperatures. In a quick search I have found one company that advertises two types of optical fiber cables intended for use at high temperatures (one for use at 150°C and one for use at 200°C). Another company offers various optical fiber cables suitable for use up to 302°F (i.e. 150°C). Clearly the statement that the cables have problems when used at temperatures of 158 °F (70 °C) is incorrect.

4. Nowhere in NFPA 130 (2010) is there a requirement for any cables to have a particular temperature rating. Sections 5.4.4 and 6.3.3.2.4 require minimum temperature ratings for the insulations to be used in stations and in trainways. Similarly the new proposed 12.3.2 has the same requirement. Cables can be built with insulations that meet any required temperature rating without the cable itself meeting the same temperature rating.

5. The proposed requirement in 11.3.3 is a blanket statement intended to prejudice users of cables.

6. The language is unenforceable as the statement “shall consider” is not something that an authority having jurisdiction can enforce.

7. This proposal was introduced at the end of the meeting without the opportunity for the committee membership (or the public, including attendees) to study it or discuss it.
130- Log #149 (Chapter 12)  
**Final Action:**

**Submitter:** Stephanie H. Markos, US Department of Transportation  
**Comment on Proposal No:** 130-209  
**Recommendation:** See proposed revisions to reduce repetition in Chapters 5 and 6 by reduction of separate numbered section, by revising many to lists.  
Delete new heading and text of 12.5 or make it broader by adding emergency lighting and communications after … "Ventilation Fans. And the appropriate subsections.  
Add ventilation as a new item in list of 5.4.1.4 and list of with 6.3.3.1 with see Section 7.7 added to both new items.  
Section heading word or phrase should be added to new 12.6, since it is a high level section number.

**Substantiation:** Why is Power Supply for Emergency Ventilation Fans here with a reference to Chapter 7? Why are not the emergency power supply for emergency lighting and communications included all together in 12.5 with a broader heading, too? with appropriate subsections to cover both the stations and guideways?

130- Log #158 (Chapter 12)  
**Final Action:**

**Submitter:** James Conrad, RSCC  
**Comment on Proposal No:** 130-209  
**Recommendation:** Add new text to read as follows:  
12.1.2 The additional requirements in Sections 12.2 through 12.6 apply to all areas except non underground trainways and open stations.  
**Substantiation:** The additional requirements are not needed in open stations.

130- Log #34 (12.1)  
**Final Action:**

**Submitter:** Kevin Cheong, Applied Engineering Solutions Ltd.  
**Comment on Proposal No:** 130-209  
**Recommendation:** Delete text to read as follows:  
of  
**Substantiation:** Since the sentence applies to “chapters” not “wire and cable” the word “of” is not necessary.
130-     Log #104
   (12.1)

   Final Action:

Submitter: Katherine Fagerlund, Sereca Fire Consulting Ltd.
Comment on Proposal No: 130-209
Recommendation: Revise text to read as follows:

12.1 Wire and Cable Applicability.
   12.1.1 This chapter applies to all portions of the system except vehicle wiring found in Chapter 8 for wires and cables in system vehicles.
   12.1.2* 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.
   12.1.3* In addition to the requirements in 12.1.1, the additional requirements in 12.2 through 12.6 shall apply to all areas except open non-underground stations and trainways.

Substantiation: The proposed revisions reflect style and terminology used in the rest of the standard, and expand the exemption for open trainways to include open stations.

130-     Log #157
   (12.1.1)

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.

130-     Log #160
   (12.1.1)

Submitter: Robert Montfort, New York City Transit
Comment on Proposal No: 130-209
Recommendation: Under the committee action, the new paragraph has an asterisk which indicates an annex note, but no note is provided.

   Recommend the following:
   12.1.1*

Substantiation: Either the annex note should be added, if one was intended, or the asterisk should be removed.
All insulations shall conform to NFPA 70 and shall be moisture- and heat-resistant type carrying temperature ratings of 90ºC (194ºF). All insulated conductor wires and cables shall be listed for wet locations and carry a temperature rating of 90ºC (194ºF). This sentence is redundant with Section 12.1.1 (NFPA 70 compliance) and itself (moisture-resistant and listed for wet locations). Insulation presumably only applies to wires and cables. Wires are generally single conductors, often installed in raceway, cables are generally single conductors with an armor and perhaps a jacket, or multi-conductor assemblies with armor and perhaps a jacket. Both wires and cables are conductors, as are uninsulated ground wires and bus-bars.

Other than open station the enclosed portion of enclosed stations There are only two types of stations, open, and enclosed (only a portion has to be enclosed to categorize the station as enclosed). I’d recommend the additional restrictions only apply to the enclosed portions of enclosed stations because the open portion should be similar in risk to an open station.

FT4/IEEE 1202 exposure requirements for cable char height, total smoke released, and peak smoke release rate of ANSI/UL 1685 All wire and cables shall comply with the cable char height, total smoke released, and peak smoke release rate of ANSI/UL 1685/FT4 Protocol, CSA FT4-ST1, or equivalent. There are two test protocols in UL 1685 (2007 at least): UL or FT4/IEEE 1202. CSA 22.2 No. 0.3-01 conversely cross-references UL 1685. CSA uses “UL 1685, FT4 protocol”, as part of FT4-ST1 rating, therefore it is presumably equivalent to the requirement. Similarly “UL 1685-FT4/IEEE 1202 protocol” implies compliance with both the smoke from UL 1685 and flamespread from CSA FT4 or the equivalent IEEE 1202. The equivalent is presumably, based on a CSA FT4 (IEEE 1202) exposure, 1.5 m of char, 0.4 m²/s peak smoke release, and 150 m² total smoke released. Since the criteria are quoted for plenum (NFPA 262) should they not be quoted for FT4-ST1 / UL1685-FT4/IEEE1202? Currently I’m not sure if the intent is to do a FT4/IEEE 1202 exposure and try to get the UL protocol results for smoke (0.25 m² peak and 95 m² total) but FT4 char (UL is 8 ft) or the ones above.
130- Log #38
(12.3.3.2)
Final Action:

Submitter: Kevin Cheong, Applied Engineering Solutions Ltd.
Comment on Proposal No: 130-209
Recommendation: Delete text to read as follows:

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 . . . shall be permitted for use instead of the wires and cables specified in Section 12.3.3.1.

Substantiation: CSA 22.2 No. 0.3-01 refers to NFPA 262 for the FT6 rating. The criteria are directly out of NFPA 262 and thus shouldn’t be repeated (or the UL1685/FT4 Protocol ones should be). Section 12.3.3 already indicates compliance with Sections 12.3.3.1 or 12.3.3.2 so the last part of the sentence is redundant.

130- Log #39
(12.4.1)
Final Action:

Submitter: Kevin Cheong, Applied Engineering Solutions Ltd.
Comment on Proposal No: 130-209
Recommendation: Delete text to read as follows:

Cabinets, and equipment enclosures

Substantiation: Wiring contained wholly within cabinets or equipment enclosures is not really part of a wiring installation method, and wiring going into the field will be done in a conduit, raceway, ducts and/or a pull or junction box (hence the leaving in of boxes). The restriction of electrical materials in general should be in a general electrical section, not a wiring installation section.

130- Log #161
(12.4.2.1 and A.12.4.2.1 (New))
Final Action:

Submitter: Robert Montfort, New York City Transit
Comment on Proposal No: 130-209
Recommendation: Add new text to read as follows:

12.4.2.1* Within the emergency ventilation air distribution system, the following wiring methods are acceptable:

(1) Type MI cable without an overall protected nonmetallic covering.
(2) Type MC cable employing a smooth or corrugated impervious metal sheath without an overall nonmetallic covering.
(3) Conductors in electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, or rigid metal conduit, all without an overall nonmetallic covering.

Add new note:

A.12.4.2.1 This requirement would apply to any emergency ventilation system that has an exhaust mode of operation where heat and/or smoke would pass through the air distribution system. It would not apply to a supply only air distribution system.

Substantiation: The proposed new text that was accepted by the committee action is confusing in such a long run-on sentence format and could be misinterpreted. The new annex note is to clarify that it is the exhaust mode of a system where heat and smoke might be transmitted. Typically emergency ventilation systems are reversible to act as a supply system or an exhaust system depending on the location of a fire emergency.
Submitter: Robert Montfort, New York City Transit
Comment on Proposal No: 130-209
Recommendation: Revise text to read as follows:

12.4.3 The emergency power, emergency lighting and emergency communications circuits shall be protected.

As an alternative the sentence could be revised as follows:

12.4.3 The emergency power circuits, lighting and communication and the circuits connected to the emergency power system as listed in Section 5.4.1.4 (old Section 5.4.11.4) and Section 6.3.3.2 (old Section 6.3.3.2.11.1) shall be protected.

Substantiation: To clarify that this requirement only applies to the emergency lighting circuits and not all lighting circuits, as well as for the communication circuits. The existing wording could be misinterpreted to mean all lighting circuits.

Submitter: Kevin Cheong, Applied Engineering Solutions Ltd.
Comment on Proposal No: 130-209
Recommendation: Revise text to read as follows:

Wire or cable

Generally, I should point out that wires typically refer to a single conductor. They are typically pulled together as a set in a common raceway. Cables generally refer to an assembly of a single conductor, armor, and perhaps a jacket, or assemblies of multiple conductors, armor and perhaps a jacket. Cables can usually be run with no, or less, external protection than wires. WRT sentence 4 therefore, some fire resistive systems use ceramifiable silicone wires (Rockbestos Surprenant, Tyco, etc.) in Electrical Metallic Tubing (raceway). This wouldn’t be a cable and thus wouldn’t meet Section 12.4.3.1(4) or 12.6. It is often difficult or impossible to get a smoke rating on fire resistive wire (it gives off smoke as part of its ceramifiable action), thus wouldn’t meet Section 12.3.3.1 or 12.3.3.2. Is the intent to prevent the use of such wiring? That pretty much leaves mineral insulated cable (Pyrotenax) and MC (also by Tyco). My understanding is that Tyco is giving up on their ceramifiable silicone EMT solution due to issues with zinc coatings in EMT.

Submitter: Harold A. Locke, Locke & Locke Inc.
Comment on Proposal No: 130-210
Recommendation: Add the following Annex A material to Sections 5.7.3, 6.3.2, and 7.2.1 as follows:

A.x.x.x Refer also to Section 4.2.1 and the associated Annex material for guidance on additional items to consider in designing for fire and life safety throughout the system.

Substantiation: The proposed annex material is intended to emphasize the importance of the concept proposed in ROP 130-210 Log #CP3 for system design.
130- Log #150  Final Action:  
(A.4.2.1)

Submitter: Stephanie H. Markos, US Department of Transportation  
Comment on Proposal No:  130-210  
Recommendation:  Revised per Mr. Locke’s comment on the proposal.  
Substantiation:  Agree with Mr. Locke.

130- Log #159  Final Action:  
(A.5.5.2.1(2))

Submitter: Robert Montfort, New York City Transit  
Comment on Proposal No:  130-213  
Recommendation:  This proposal should be rejected. All escalators in modern stations regardless of the depth of the station are integral means of egress components and are part of the egress calculations as stairs (non-moving). There is no real data to prove that adding the escalators to emergency power will provide any additional benefit with regard to exiting time. Providing emergency power for all of the escalators will add a significant cost to a new station. There is also a very low probability that an emergency egress event will also happen at the same time as loss of power to all the escalators. In a blackout, where two sources of power are provided then both will be lost and adding back-up power via batteries or a generator is unwarranted and extremely costly. There are also many other factors that could make an escalator unavailable that have nothing to do with power (control failure). Before any material is added to an annex that implies improved exiting time, there should be concrete evidence that it will.  
Substantiation:  There is a reason that escalators are used only as stairs in the egress calculations and that is there is no way to assure that they will be operational during an evacuation event. That is also why one escalator is deemed to be out of service (no steps available) to insure a level of egress availability. Just recommending to connect it to emergency power will not insure that the escalator remains operational. There are too many other factors that might cause the escalator to be out of service. NYCT’s experience on any given day has been that approximately 10 percent of our escalators are stopped. In all modern stations escalators are an integral means of egress, just not running. Someone could misinterpret this statement that emergency power will decrease the time for egress when it may not. The Standard should not include any statement that can be interpreted as improving safety when it has not been proven. If a property owner wants to put them on emergency power there is no reason they cannot do it. The proposed wording should not be accepted.

130- Log #105  Final Action:  
(A.5.5.6.3.2.3 (New))

Submitter: Katherine Fagerlund, Sereca Fire Consulting Ltd.  
Comment on Proposal No:  130-220  
Recommendation:  Revise text to read as follows:  
A.5.3.5.3 A.5.5.6.3.2.3 Where the vertical rise exceeds 15 m (50 ft.), the capacity and travel speed for stairs should be adjusted downward as indicated in Table A.5.3.5.3 to account for fatigue. Additionally, the design should provide for enlarged landings to allow pedestrians to rest without impeding egress flow.  

*****Insert Table A.5.3.5.3 Here*****

Substantiation:  The proposed revisions reflect new information obtained from timed stair climb events.
### Table A.5.3.5.3  Travel Speed and Flow Volume Adjustments for Elevation Gain on Stairs

<table>
<thead>
<tr>
<th>Vertical Rise</th>
<th>Travel Speed (vertical component)</th>
<th>Flow Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per 5.3.5.3</td>
<td>15 m/min (48 fpm)</td>
<td>0.0555 p/mm-min (1.41 pim)</td>
</tr>
<tr>
<td>&gt; 15 m (50 ft)</td>
<td>10 m/min (33 fpm)</td>
<td>0.0215 p/mm-min (0.55 pim)</td>
</tr>
<tr>
<td>&gt; 28 m (91 ft)</td>
<td>10 m/min (33 fpm)</td>
<td>0.0215 p/mm-min (0.55 pim)</td>
</tr>
<tr>
<td>&gt; 260 m (853 ft)</td>
<td>4 m/min (13 fpm)</td>
<td>0.0088 p/mm-min (0.22 pim)</td>
</tr>
</tbody>
</table>
Submitter: John Nelsen, Seattle Fire Department

Comment on Proposal No:  130-17

Recommendation:  Revise text to read as follows:

A.5.7.6 It is not the intent of the paragraph to require any of the equipment in the list, other than the telephone for fire department use, but only to provide the controls, panels, annunciators, and similar equipment at this location if the equipment is provided or required by another section of the Code.

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:

Submitter: John Nelsen, Seattle Fire Department

Comment on Proposal No:  130-17

Recommendation:  Delete text to read as follows:

A.6.2.7.4 The placement of blue light stations at the ends of station platforms should be governed by actual need. For instance, an at-grade system that has stations in dedicated streets and overhead power supply would not need blue-light stations at the ends of platforms.

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:

Submitter: Stephanie H. Markos, US Department of Transportation

Comment on Proposal No:  130-230

Recommended:  First line should be revised to delete rail transit after "and" and insert fixed guideway before "industry"

Substantiation:  For consistency of usage and application, as agreed to in previous cycles.
Submitter: John Nelsen, Seattle Fire Department
Comment on Proposal No: 130-17
Recommendation: Delete text to read as follows:

Comprehensive and dependable communications are essential for an effective and efficiently operated fixed-guideway transit system during emergencies.

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:

Submitter: John Nelsen, Seattle Fire Department
Comment on Proposal No: 130-17
Recommendation: Revise text to read as follows:

The placement of blue light stations should be governed by actual need. For instance, an at-grade system that has stations in dedicated streets and overhead power supply would not need blue light stations at the ends of platforms. Blue light stations may be provided at the following locations:

(1) At the ends of station platforms
(2) At cross-passageways (see Section 6.2.2.3)
(3) At emergency access points
(4) At traction power substations
(5) In underground trainways as approved

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:

Submitter: Stephanie H. Markos, US Department of Transportation
Comment on Proposal No: 130-234
Recommendation: Revise text as noted in Mr. McKinney's vote comment.

Substantiation: See Mr. McKinney's vote comments.
### 130- Log #166

**Final Action:**

**Submitter:** Silas K. Li, Parsons Brinckerhoff, Inc.

**Comment on Proposal No:** 130-237

**Recommendation:** Revise text to read as follows:

**B.8 Nonfire Tunnel Ventilation.**

**B.8.1 Congested Operations.** Where trains might be stopped or delayed in a tunnel for a period of time, the vehicle ventilation system should be capable of maintaining an acceptable level of patron comfort. If not operating in a fire or other emergency scenario, the tunnel ventilation fans can be used to augment the vehicle system capability. Velocities should consider the comfort levels of employees required to be in the tunnels.

**B.8.2 Maintenance Activities.** Maintenance activities within station and tunnel areas can include heat, dust or fume producing operations such as grinding, welding, or painting; operation of fuel powered vehicles or equipment; and other operations that affect tunnel air quality or temperature. If not operating in a fire or other emergency scenario, the tunnel ventilation fans can be used to address the safety and comfort of employees working in the affected tunnel and station areas. In such cases, velocities should consider the comfort levels of employees required to be in the tunnels.

**B.8.3 Tunnels in Gassy Ground.** Tunnels in gassy ground may be subject to ingress of flammable gasses or other hazardous gases. Gases of concern include hydrogen sulfide (H₂S) and methane (CH₄). The ventilation system should be designed to satisfy two objectives: 1) to avoid pockets of gases forming and 2) to achieve dilution of gas inflows through a design crack. The ventilation design should be coordinated with the gas detection and alarm system type and the activation levels selected. The design should consider two general conditions: ongoing or periodic ventilation requirements to meet expected average gas ingress rates, and reaction to potential abrupt increases in gas ingress, such as might result from future construction, climate events or seismic activity.

**Substantiation:** Current language mentions system maintenance activities only in passing, and omits other non-fire ventilation requirements, particularly those related to gassy ground. Changes are required to clarify these other important roles for tunnel and station ventilation systems.

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

William D. Kennedy ROP #110.

### 130- Log #106

**Final Action:**

**Submitter:** William E. Koffel, Koffel Associates, Inc.

**Comment on Proposal No:** 130-238

**Recommendation:** Accept the proposal and make other changes as necessary to reflect subsequent changes to the Standard.

**Substantiation:** The Ballot is not clear in that the Action is shown as Reject and yet the action also states that the Annex is to be revised to be consistent with the Standard. The Committee Statement also incorrectly states that the proposal does not comply with the Regulations. Specific and general changes are identified in the proposal.

### 130- Log #107

**Final Action:**

**Submitter:** William E. Koffel, Koffel Associates, Inc.

**Comment on Proposal No:** 130-72

**Recommendation:** Revise the example calculations to represent a capacity of 60 ppm for single leaf doors and gates.

**Substantiation:** As noted in the original Public Proposal, the calculations in Annex C are not consistent with the requirement in this section. Whereas the Committee rejected the Public Proposal, the values in Annex C need to be revised.
Submite: Marcelo M. Hirschler, GBH International
Comment on Proposal No: 130-241
Recommendation: G.1.2.4 ASTM Publications.

American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.
ASTM D 3675, Standard Test Method for Surface Flammability of Flexible Cellular Materials Using a Radiant Heat Energy Source, 2009\textsuperscript{a} 2011\textsuperscript{a}.
ASTM E 162, Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source, 2012\textsuperscript{a} 2009\textsuperscript{a}.
ASTM E 814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops, 2011\textsuperscript{a} 2010\textsuperscript{a}.
ASTM E 1354, Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter, 2011\textsuperscript{b} 2010\textsuperscript{a}.
ASTM E 2061, Standard Guide for Fire Hazard Assessment of Rail Transportation Vehicles, 2012 2009\textsuperscript{a}.

Substantiation: Standards Update.