National Fire Protection Association
1 Batterymarch Park, Quincy, MA 02169-7471
Phone: 617-770-3000 • Fax: 617-770-0700 • www.nfpa.org

TECHNICAL COMMITTEE ON FINISHING PROCESSES

AGENDA
Pre-Cycle Meeting
Hilton Greenville
Greenville, South Carolina
October 10th, 2012 8 AM-1 PM
October 11th, 2012 8 AM-4 PM

Day One

7:30-8 AM Continental Breakfast Provided

1. Call to Order-New Committee Chair, Tom Euson.

2. Introduction of Attendees and Update of Committee Roster. (Attachment Nº 1)

3. Approval of Minutes of Last Meeting. (Fort Lauderdale June 2012-Attachment Nº 2)

4. Report of Committee Chair.

5. Report of Staff Liaison-Presentation, Overview of the New Process.

6. Presentation-Bob Feldkamp- Fire Tests in Powder Spray Booths

7. Report of Task Group on Article 516 (Draft to be sent prior to meeting)

8. Report of Task Group on Membrane Enclosures-Note Guy Jones comments separate (Attachment Nº 3 and 4)

12:00 PM Lunch-Provided

Adjournment BMW Field Trip (2 PM)-optional

Day Two

7:30-8 AM Continental Breakfast Provided

9. Report of Task Group on "3 foot rule"

10. Review and Possible Action on Public Inputs on NFPA 33 and NFPA 34 Received to Date. (Attachment Nº 5 and 6)

11. Report on Review of Chapters by Committee Members . (Attachment Nº 7)

12. Old Business-
    - Review of EU standards
    - NFPA 409 Airplane Hangars
    - Definitions-“air recirculation filter house” and “secondary recirculation particulate filter”,
    - Fire wall versus fire rated wall
    - Water wash booths for nitrocellulose lacquers
    - Redrawing diagrams in NFPA 33/34 Chapter 6

12. New Business.

13. Schedule Next Meeting(s).

14. Adjournment.

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TECHNICAL COMMITTEE ON FINISHING PROCESSES

MEMORANDUM

TO: **Technical Committee on Finishing Processes**

FROM: **Nancy Pearce**

DATE: **July 2, 2012**

SUBJECT: **Minutes of June 5 – 6, 2012 Meeting**

Ladies and Gentlemen:

Attached are the Minutes of the meeting of the Technical Committee on Finishing Processes, held June 5 and 6, 2012 at the Embassy Suites, Ft. Lauderdale FL.

These Minutes will also be posted on the Document Information pages for NFPA 33 and NFPA 34 on NFPA's Codes and Standards web site and can be downloaded from there.

Please review these Minutes for any errors or omissions and notify me of same as soon as possible.

Also, there are a number of Task Group assignments and other work assignments in these minutes, so please review carefully to determine which Task Groups you've agreed to join and which other tasks you might have agreed to perform.

Finally, under New Business, each Technical Committee member is asked to select one or more chapters of NFPA 33 and/or NFPA 34. Please review your selected chapter(s) for vague or unenforceable text and be prepared to suggest amendments to address same at the next (October) meeting. Please let the Staff Liaison know as soon as possible which chapters you will review.

rpb/

cc FAA Meeting File
FAA/NM

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TECHNICAL COMMITTEE ON FINISHING PROCESSES

MINUTES of MEETING

Technical Committee on Finishing processes
Embassy Suites Hotel
Ft. Lauderdale, Florida
June 5 and 6, 2012

I. ATTENDANCE

D. W. Ankele, Underwriters Laboratories Inc.
A. Anschell, Liberty Mutual Group
(Rep. Property Casualty Insurers Association of America)
D. Doherty, General Motors North America (Rep. NFPA Industrial Fire Protection Section)
T. G. Euson, 3S Incorporated, SECRETARY
R. J. Feldkamp, Nordson Corporation
S. J. Gunsel, SGTechnologies, LLC, CHAIR
J. S. Gustin, Travelers Insurance Company
~~E. L.~~ Guy Jones, ~~Nordson~~ Amerex Corporation
M. J. Korecky, Rohm and Haas Company
J. C. Larson, DuPont Performance Coatings
D. P. Mason, AEGIS Insurance Services
J. McKnight, National Marine Manufacturers Association
(Rep. Society of the Plastics Industry)
L. Miles, Miles Fiberglass & Composites
(Rep. American Composites Manufacturers Association)
J. R. Moore, E. I. DuPont Company
G. A. Raifsnider, Global Finishing Solutions
D. A. Rivord, Graco Incorporated
D. R. Scarbrough, Elyria, OH
R. A. Schulz, XL Global Asset Protection Services
B. Thomas, BECCA Incorporated

R. Benedetti, NFPA STAFF
N. Pearce, NFPA STAFF LIAISON

GUESTS: R. Arrighetti, Broward County Fire Rescue & Emergency Svces
G. J. Cahanin, Cahanin Consulting
R. Galvez, Fire Protection International
J. Parks, Lauderdale Marine Center
C. Pierin, Dürr Systems, Inc.
B. Van Den Breen, Broward Shipyard

II. MINUTES

1. The meeting was called to order by Technical Committee Chair Steve Gunsel at 8:15 AM on Tuesday, June 5, 2012.

2. Attendees introduced themselves. The Technical Committee roster was corrected as necessary.

3. The Minutes of the last meeting (September 29 & 30, 2009 in Savannah GA) were unanimously approved as submitted.

4. Technical Committee Chair Steve Gunsel reviewed the meeting agenda.

5. NFPA Staff Liaisons Nancy Pearce and Bob Benedetti reported on the following:

   - Technical Committee Membership:
     - Balance of interests was reviewed.
     - The following new members were announced:
       Andrew Anschell, Liberty Mutual Group (Alt. to Rob Friberg)
       James Gustin, Travelers Insurance
       Guy Jones, Amerex Corp.
       David Schutt, 3M Company (Alt. to Steve Jensen)
     - Nancy Pearce was introduced as the Technical Committee's new Staff Liaison.
     - It was announced that all current Technical Committee members were reappointed.
     - It was announced that Rob Friberg would receive a Committee Service Award at the 2012 NFPA Conference and Exposition.
   - The new Technical Committee Scope statement was announced.
   - The deadline dates for the Fall 2014 Document Revision Cycle were reviewed.

6. **Marine Spray Finishing in Membrane Enclosures.** The Technical Committee heard presentations on marine spray finishing enclosures whereby the vessel is surrounded by scaffolding, then the scaffolding is enveloped in shrink wrap, creating an enclosure.

   Bob Arrighetti led off the discussion and showed how the enclosures are put together. He noted that this procedure originated in Europe, particularly in Germany and Russia, about 20 years ago. He described the set-up as using a shrink wrap membrane that complies with NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*. The enclosed space is ventilated, with ventilation interlocked to spray apparatus. Concentration of combustible vapors is monitored, with an alarm at 8% lower flammable limit and shut-down at 10%. He noted that the Broward County Building Department does not consider the enclosure a structure subject to the building code, because it is not in place for more than 90 days

   Rick Galvez continued the discussion with a slide presentation [See Attachment Nº M1.] and reviewed the building versus fire prevention code issues. He pointed out that the enclosure is primarily a dust and moisture control mechanism and that ventilation provides a sweep of clean air from fore to aft. Code evaluation began with NFPA 312, *Standard for Fire Protection of Vessels during Construction, Conversion, Repair, and Lay-up,* and was extended to numerous other NFPA codes and standards.

   Jim Parks, Lauderdale Marine Center, stated that they have been using this method for the past 8 years as a means to control dust and grit during preparation work. After the preparation stage is completed, the membrane is removed from the scaffolding and discarded. All dust and deposits are vacuumed. A new membrane is then installed for the spray painting sequence. This controls vapors and overspray. Initially, the fire department stopped the operation because it was not compliant with NFPA 33. For the first few weeks, marine chemists were used to monitor the exhaust stream for vapors under OSHA shipyard regulations.

   Greg Cahanin reviewed for the committee a proposed new chapter developed by himself and a colleague, Steve Cocabani. This chapter has been submitted as a formal proposal to amend NFPA 33. The chapter scope applies only to OSHA 1915 marine operations, thus preventing application to auto refinishing. Third party review was provided.

One question raised by the Technical Committee was what advantage is there in adding this new chapter to NFPA 33. The response was that the industry and fire officials want to get the enclosure recognized as "not a structure", so that the building codes don't apply. If NFPA 33 doesn't cover this process, then NFPA 33 should, at the least, exempt the process from its scope, to prevent misapplication of the provisions of the standard.

One other factor is that there has to be a delay in shut-down. This is necessary to allow the applicator to complete the application pass and shut the spray gun. Jim Parks explained that, if ventilation is abruptly stopped, it can adversely alter the spray pattern. Overspray will then settle on previous work and cause "orange peeling".

The Technical Committee adjourned for lunch and for tours of two facilities that use this procedure. The first was Lauderdale Marine Center, where the committee observed the set-up of the membrane enclosure for the preparation sequence and for spray painting. The second was Broward Shipyard, where the committee observed demonstrations of an on-line vapor detection system.

The Technical Committee reconvened on June 6 to further discuss whether to address these membrane enclosures. The Technical Committee agreed they had three options:

– do nothing
– provide a specific exemption from NFPA 33
– address the enclosures with appropriate provisions

After much debate, the Technical Committee established a Task Group to address the issue, using the Cahanin proposal as a starting point. Dennis Mason agreed to chair the Task Group. The following individuals agreed to participate: Messrs. Ankele, Arrighetti, Cahanin, Feldkamp, Galvez, Jones, Korecky, McNight, Parks, Raifsnider, Scarbrough, and Thomas, (Tom George).

Resource material for the Task Group includes Agenda Attachments Nºs A5a through A5g.

7. The Technical Committee discussed correlation issues between NFPA 33 and Article 516 of NFPA 70. This has been a recurring issue resulting in conflicting information given in NFPA 33 and in Article 516, with respect to area classification around both open and completely enclosed spray booths. The issue was brought to a focus as a consequence of a proposal to amend Article 516 to correlate with NFPA 33 that was made by Geoff Raifsnider. The proposal to amend Article 516 was rejected, but Code-Making Panel 14 of the National Electrical Code Committee agreed to reconsider the amendment during the public comment stage, if a Task Group representing both groups could agree on a revision.

   The Technical Committee established a Task Group to develop a comment for CMP-14's consideration. The scope of the Task Group's work was expanded to include any conflicts between NFPA 33, NFPA 409, *Standard on Aircraft Hangars*, and Article 513 of NFPA 70, per Item #9 below. Don Ankele, who is a member of both CMP-14 and this Technical Committee, was appointed Chair of the Task Group. Bob Benedetti agreed to serve as Task Group secretary. The Technical Committee directed that the comment be completed by September 30, 2012, as the Comment Closing Date for NFPA 70 is October 17, 2012. Other Task Group members are Messrs. Cadd (CMP-14), Dockerman (NFPA 409), Euson, Raifsnider, and Walker (CMP-14) William Lawrence (CMP-14), Jeremy Neagle (CMP-14) and Ed Briesch (CMP-14).

   Resource material for the Task Group includes Agenda Attachments Nºs A6a through A6d.

8. The Technical Committee discussed the use of HEPA filters on spray booth exhaust ports as an alternative to a direct exhaust to outside. Without further information from John Gokey, the Technical Committee decided to defer action on this. Bob Feldkamp agreed to research the issue.

9. The Technical Committee discussed correlation between NFPA 33, NFPA 409, and Article 513 of NFPA 70. The Technical Committee decided to address this under the same Task Group effort as for Article 516. (See itm #7 above.) Bob Benedetti agreed to research the Article 513 text versus NFPA

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409. Don Ankele agreed to ask CMP-14 Chair Robert Jones if CMP-14 would entertain a public comment on Article 513 generated as a consequence of the original Article 516 proposal, as a related issue on the basis of eliminating an apparent conflict.

10. The Technical Committee heard a report from Bob Feldkamp on the status of European Union standards on spray application of liquid and powder coatings. He explained that the European committees would like to share information. However, where NFPA meetings are open to anyone, European committees are open only to citizens of member nations. Bob also explained that, of the seven standards listed in the agenda item (EN1953, EN50050, EN 50176, EN50177, EN12215, EN12981, and EN 13355), only EN12215, EN12981, and EN13355 were of concern to NFPA 33. The Technical Committee directed Bob to review these documents to identify any conflicts with NFPA 33.

11. The Technical Committee discussed fire protection considerations for certain new technology spray booths. Specifically, two new booth designs have been introduced in the automotive industry and they pose different protection challenges from conventional designs. The Technical Committee was initially introduced to these at the September 2009 meeting last cycle.

    The first is a dry scrubber booth utilizing finely crushed limestone as a filter media, with cartridge filters as secondary filtration. Mr. Pierin, Dürr Industries, presented information on the Dürr's EcoDry system. The Technical Committee decided to establish a Task Group to determine what, if any, changes need to be made to NFPA 33 with respect to this technology. The Task Group consists of Messrs. Doherty, Schulz, Pierin, Raifsnider (Chair), ~~and~~ Scarbrough, Amy Brown~~.~~

    Tom Euson reported that the Eisenmann electrostatic system, to be discussed under this Agenda Item, has been phased out and is, therefore, no longer an issue.

12. The Technical Committee reviewed NFPA 33's provisions for sprinklers in exhaust ducts and determined there was no issue.

13. The Technical Committee heard a report and presentation [See Attachment Nº M2.] by Dean Doherty on the rationale for eliminating the 3-foot Class I, Division 2 bubble around booth doors for totally enclosed spray booths, ~~where the ventilation system is interlocked to shut down the spray application on loss of ventilation~~ where opening the door stops painting operation. The Technical Committee agreed in principal to this, based on Dean's presentation and directed him to prepare a proposed amendment for consideration by the committee at the next meeting.

14. There was no correspondence requiring the Technical Committee's attention.

15. There was no old business requiring the Technical Committee's attention.

16. Under New Business, the Technical Committee reviewed the text of Annex Section D.1.2(4) of NFPA 33, regarding water-wash spray booths for nitrocellulose lacquers. According to Geoff Raifsnider, this annex item is used as the basis for legal action, because the suggestion for use of water-wash booths is not mandatory. He suggests adding a sentence to Subsection 5.6 of the standard stating that dry filtration shall not be used for coatings that contain nitrocellulose.

    Bob Benedetti was directed to provide any relevant background material from the Technical Committee on Manufacture of Organic Coatings to Goeff Raifsnider.

    Also under New Business, each Technical Committee member is asked to select one or more chapters of NFPA 33 and/or NFPA 34. Please review your selected chapter(s) for vague or unenforceable text and be prepared to suggest amendments to address same at the next (October) meeting. Please let the Staff Liaison know as soon as possible which chapters you will review.

17. The Technical Committee reviewed possible issues from recent advisory service inquiries.

    - RE: 1.1.6 of NFPA 33, there still is confusion about what is meant by "repeatedly in the same location" and "occasional". If any Technical Committee member has an idea as to how to define either phrase, please send same to the Staff Liaison.

- RE: definitions for "air recirculation filter house" and "secondary recirculation particulate filter", the Technical Committee decided not to set performance requirements for secondary filters. However, the Technical Committee did establish a Task Group to develop suggestions. The Task Group consists of Messrs. Doherty, Feldkamp, Larson (Chair), and Raifsnider.

- RE: 3.3.2.3 of NFPA 33, the question of whether three (or more) levels of filtration in a recirculating spray booth, should be considered part of the secondary filtration was delegated to the above noted Task Group.

- RE: 3.3.16 of NFPA 33, the suggested new definition was deemed unnecessary, since it would rule out the use of cyclone collectors for powder booths.

- RE: Redrawing diagrams in Chapter 6 of both NFPA 33 and NFPA 34 to better distinguish between the actual outline of the piece of equipment (booth, dip tank, etc.) and the boundaries of the classified area, the Staff Liaison was directed to work with NFPA's technical artist to accomplish this.

- RE: Suggestion to require, in Chapter 7 of both NFPA 33 and NFPA 34, an interlock between the equipment and the make-up air system, the Technical Committee declined to do this.

- RE: 7.4 of NFPA 33, the Technical Committee agreed to replace the term "fire wall" with "fire-rated wall".

- RE: Section 8.2 of NFPA 33, the Technical Committee declined to define "process area" within the context of a "spray area".

- RE: Suggested addition to 9.4.6(3) of NFPA 33, there is no need for this, as the text in question appears in Subsection 9.4.3.

- RE: 10.2.1 of NFPA 33, the Technical Committee declined to offer guidance.

- RE: Suggested distinction between direct-fired and indirect-fired drying, NFPA 86 addresses the issue.

18. The Technical Committee decided to next meet on October 9 and 10, 2012 or October 10 and 11, 2012, in Greenville SC. The Technical Committee will try to arrange a tour of the BMW manufacturing facility in Greenville.

19. The Technical Committee meeting adjourned at 2:00 PM on June 6, 2012.

33- Log #8 Final Action:
(1.1.10)

Submitter: Timothy J. Myers, Exponent, Inc.
Recommendation: Add text to read as follows:
1.1.10 Processes that handle combustible powders or dust and create a fire or explosion hazard that are not specifically covered by this standard shall comply with the relevant section of NFPA 654.
Or in Chapter 14 add specific requirements (or cross-references to NFPA 654) for processes like:
• Supersack unloading or bag dump stations
• Pneumatic conveying systems between raw material unloading areas and the powder coating equipment
• Bins, hoppers, fluid beds that feed spray nozzles
• Powder storage areas
• Screening or sieving operations
Substantiation: In the NFPA 654 ROP, the NFPA 654 committee added the following language that would remove the possible overlap between NFPA 33 and NFPA 654:
"1.4.1 This standard shall not apply to materials covered by the following documents, unless specifically referenced by the applicable document:
…
(2) NFPA 33, Standard for Spray Application Using Flammable or Combustible Materials"
However, "materials covered by" NFPA 33 may be used in processes or applications that are not covered by NFPA 33. For instance, a company that manufactures, blends, or packages powder coating powder, but does no powder coating, may no longer fall under NFPA 654 because the material is covered by NFPA 33, even though NFPA 33 may not contain any requirements for their processes used to manufacture, blend, or package powder coating powder. Even in facilities that conduct powder coating may use auxiliary equipment that is outside or away from the "Spray Area" but is not covered by NFPA 33. This may include the following equipment:

· Supersack unloading or bag dump stations
· Pneumatic conveying systems between raw material unloading areas and the powder coating equipment
· Bins, hoppers, fluid beds that feed spray nozzles
· Powder storage areas
· Screening or sieving operations

The committee should either add language that would require compliance with NFPA 654 for powder handling processes not covered by NFPA 33, or add additional language to NFPA 33 in Chapter 14 to cover these processes.

33- Log #9 Final Action:
(4.2.1 and Chapter 18 (New))

Submitter: Gregory J. Cahanin, Cahanin Fire & Code Consulting
Recommendation: Paint Spraying Using Marina Membrane Enclosures
[-a new chapter 18, renumbering the existing Chapter 18 to Chapter 19, Training]
Add a new 4.2.1:
4.2.1 Marine Vessel Spray Painting. Marina Repair Facilities subject to OSHA CFR 1915 provisions for shipbuilding or repairing shall be permitted to paint vessels in temporary membrane enclosures in accordance with Chapter XX.
4.2.1.1 Painting of vessel components or parts removed from vessels or design for installation on vessels shall utilize spray application operations and processes confined to spray booths, spray rooms, or spray areas as defined in this standard.
Insert a new Chapter 18.
Spray Painting in Temporary Membrane Enclosures
18.1 Scope. Paint spraying in temporary membrane enclosures shall follow the requirements established in this Chapter. Only Marina Repair Facilities subject to OSHA CFR 1915 provisions for shipbuilding or repairing shall be permitted to paint vessels in temporary membrane enclosures in accordance with this chapter.
18.1.1 Painting of vessel components or parts removed from vessels or designed for installation on vessels shall utilize spray application operations and processes confined to spray booths, spray rooms, or spray areas as defined elsewhere in this standard.
18.1.2 Small paint stands or booths outside of vessel membrane enclosures are not to be permitted under this chapter.
18.2 General. Temporary Membrane Enclosures shall be erected for 180 days or less.
18.3 Location. Membrane enclosures may be constructed for spray painting in buildings or outdoors at marine facilities subject to OSHA CFR 1915.
18.4 Membrane enclosure occupancy.
18.4.1 Only personnel required for spray painting shall enter the membrane enclosure during spray painting.
18.4.2 Vessels within membrane enclosures shall not be occupied during spray paint operations.
18.4.3 A ship watch aboard vessels when the vessel is encapsulated shall be permitted except when spray painting is being performed.
18.4.4 Vessels shall not be occupied for sleeping at any time within a membrane enclosure.
18.3 Construction and Design of Temporary Structures
18.3.1 The spray paint area shall consist of the temporary membrane enclosure and a 5-foot zone outside of the enclosure.
18.3.1.1 No hot work, welding, grinding or cutting shall take place in the spray paint area while it is permitted for spray painting.
18.3.1.2 No vehicles, ordinary combustibles, portable buildings or container storage shall be located in the 5-foot safety zone during spray operations.
18.3.1.3 No smoking or open flames shall be allowed in the paint spray area including the membrane enclosure while it is permitted for spray painting.
18.3.1.4 Membrane enclosures shall be permitted to be used for activities other than spray painting. Other uses of the membrane enclosure shall comply with applicable codes or standards.
18.3.1.5 Travel distance to an exit from within a membrane structure shall comply with NFPA 101-Table 40.6 for General Industrial Occupancies.
18.4 Membrane Material
18.4.1 Membrane shrink wrap material used for membrane enclosures shall have been tested and passed the NFPA 701 Test 2 requirements. Testing shall have been performed by an independent test laboratory.
18.4.2 Contractors installing shrink wrap shall provide documentation of the shrink wrap material they are using on membrane enclosures to the marina and have such documentation available for review by any AHJ when requested. Any substitution of any other manufactures material shall require a separate letter and documentation before installation.
18.4.3 Membrane enclosures having shrink wrap that does not have NFPA 701 Test 2 compliant material shall not be permitted for spray painting.
18.5 Electrical and Sources of Ignition
18.5.1 Electrical wiring and utilization equipment used in membrane enclosures during spray painting shall comply with Chapter 6.
18.5.2 All lighting, electrical power cords, and any related equipment within the membrane enclosure and five-feet

horizontally from the exterior of the membrane enclosure that is energized shall be rated for Class I Division 1 as defined by NFPA 70 when used during spray paint operations.

18.5.3 Vessels shall be grounded. Grounding by vessel shore power cords neutral ground, independently outside by attachment of a rod driven into the ground or any other appropriate method consistent with 6.2.1 referenced requirements.

18.5.4 Scaffolding shall be grounded to the vessel, to an appropriate grounding rod, or other approved method consistent with 6.2.1 referenced requirements.

18.5.5 Spray paint equipment shall be grounded.

18.5.6 Vessels and membrane enclosures without active spray painting tasks in buildings and outdoors shall have power cords and lighting rated for outdoor use. Ordinary portable electrical tools and equipment may be used in these areas.

18.5.7 For building electrical systems more than 18-inches from the floor outlets and switches shall be permitted to be NEMA 3. (annex note: NEMA 3 is a weathproof classification for outdoor electrical and appropriate due to the water wash-down of vessels in preparation for painting.

18.5.8 Building electrical systems less than 18-inches from the floor and outside of a membrane enclosure and its 5 foot safety zone shall be considered Class I Division 2 locations as defined by NFPA 70.

18.6 Spray Paint Ventilation

18.6.1 Each membrane enclosure shall be provided with mechanical exhaust ventilation that is capable of confining and removing vapors and mists to a safe location and is capable of confining and controlling combustible residues, dusts, and deposits consistent with Chapter 7 requirements as they apply to portable ventilation equipment.

18.6.2 Ventilation equipment shall be installed in accordance with Section 5.6.

18.6.3 Ventilation equipment containing overspray collection filters shall have visible gauges, audible alarms, approved interlocks, or an effective inspection program to ensure that the required air velocity is being maintained.

18.6.4 Spray Painting and ventilation equipment shall have interlocks between ventilation and all paint spray equipment via a connection on the ventilation fan or an NFPA 70 compliant junction box such that a shutoff of the ventilation fans will turn off spray painting equipment.

18.6.4.1 Where interlocks cannot be effectively provided for ventilation equipment that uses plant air, large air storage tanks, or equipment that cannot be instantly shutoff an audible alarm upon loss of ventilation that will alert all spray paint operators shall be permitted with AHJ approval.

18.6.5 The concentration of the vapors and mists in the exhaust stream of the ventilation system during spray painting operations shall not exceed 10 percent of the lower flammable limit under OSHA 1915.35.

18.7 Spray Paint Equipment Requirements

18.7.1 Any contractor supplying exhaust equipment for painting and coating work in membrane structures to provide documentation that equipment complies with NFPA 91 and Chapter 7 requirements. Records shall be made available to the AHJ or any inspecting authority upon request.

18.7.2 All equipment shall bear a permanent unique number or other designation to identify equipment in use.

18.7.3 Marinas shall keep records on file of approved equipment. Such records may be in the form of a memorandum stating the equipment number, the owner of the equipment and the leaser of the equipment if any and state that the marina has accepted the equipment for use at the facility. Records shall be made available to the AHJ or any inspecting authority upon request.

18.6 Storage and Handling of Flammable and Combustible Liquids

18.6.1 Coating Material Handling. Flammable and combustible paints, coatings, and cleaning agents for equipment within the membrane enclosure and its 5-foot safety zone shall not exceed 10 gallons total at any time.

18.6.1.1 All mixing and storage shall be done outside the membrane enclosure area.

18.6.1.2 Mixing rooms and storage rooms shall comply with Chapter 8.

18.6.1.3 Flammable liquid storage cabinets in fixed building locations shall be in accordance with NFPA 30 requirements.

18.6.1.4 Portable containers used for the storage of combustible and flammable liquids shall be in accordance with Chapter 8 and NFPA 30 requirements.

18.6.1.5 Containers for servicing vessels stored outside shall not be placed within five feet of any membrane enclosure.

18.7 Permitting

18.7.1* Permits for spray painting shall be issued for each spray paint activity on a daily basis. Paint Spray Permit Records shall be kept for 12 months for review by the AHJ. [Note * for sample form in annex]

18.7.2 Competent Persons, certified as an OSHA Competent Person under OSHA 1915.7, shall perform all Spray Paint Permitting for membrane structures.

18.7.3 Spray Painting shall not be performed in any membrane enclosure until the Paint Spray Permit Record is signed by a Competent Person and posted at the entrance to the enclosure.

18.7.4 The Competent Person shall have the authority to stop the spray painting operation if any equipment malfunctions, if combustible gas detection readings exceed 10 percent of LFL readings, or if any spray operations are deemed unsafe by the Competent Person.
18.7.5 No spray paint operations shall take place without permitting by a Competent Person present at all times that spray painting is in progress.
18.7.6 Combustible Gas Testing in accordance with OSHA 1915.35, Surface Preparation and Preservation shall be performed by the competent person prior to the start of spray painting and during spray painting operations.
18.7.7 The Competent Person shall inspect all electrical connections within the membrane enclosure as a part of permitting.
18.7.8 The Competent Person shall insure that any electrical equipment energized within the membrane structure and the 5-foot safety zone is rated Class I Division 1 per NFPA 70 and the vessel, scaffolding, ventilation equipment, and spray equipment are grounded.
18.7.9 The Competent Person shall insure that ventilation exhaust equipment and paint spray compressors are interlocked. For spray painting within membrane enclosures interlocked shall mean that the spray application equipment cannot be operated unless the exhaust ventilation system is operating and functioning properly and spray application is automatically stopped if the exhaust ventilation system fails. (note-taken from NFPA 33-14.3.5.2)
The Competent Person shall have the authority to stop the spray painting operation if any equipment malfunctions, if the combustible gas detection exceeds 10 percent of LFL readings, or if any spray operations are deemed unsafe by the Competent Person.
18.8 Protection
18.8.1 Portable fire extinguishers shall be placed within the membrane enclosure in the vicinity of spray paint operations.
18.8.1.1 Extinguishers shall be inspected and maintained in accordance with NFPA 10.
18.8.1.2 Extinguishers shall be permitted to be covered in clear plastic bags to protect them from overspray.
18.8.1.3 The minimum size of all extinguishers shall be 4A-20B-C and spaced no more than 30-feet from the spray painting operator. Where several spray guns are being used at one time, fire extinguishers for each spray gun shall be provided when separated by more than 30-feet or the width of the vessel.
18.8.2 Fire sprinkler systems in buildings where membrane enclosures are used shall be capable of providing a density of 0.40 gpm/sq.ft. over the most remote 2,500 sq.ft. with a 500 gpm hose allowance for a duration of 2 hours. Fire Sprinklers shall be designed and installed in accordance with NFPA 13.
18.8.3 Fire systems on vessels that include engine room fire suppression and fire alarm and detection systems are to remain active during spray painting.

****Insert Artwork Here****
Annex A Spray Permit Record Form

Substantiation: The marine industry world-wide has developed a method of spray painting in temporary membrane enclosures that currently exist outside of any nationally published standard. Marina's in the United States have been using this method for more than a decade with no national standard in place. There has never been a fire during spray painting in a membrane enclosure recorded in the U.S. or abroad. As this method of painting large boats gained traction in the industry there is a likelihood of smaller facilities adopting some of the practices with a resulting exposure to fire loss unless a national standard is established. Local AHJ's may lack the expertise to adequately determine that a safe environment is created for spray painting that a national standard provides.
This proposal is based upon an equivalent method developed for a marina and accepted in full by the local jurisdiction. The equivalent method was developed by me with equal involvement of Steve Kowkabany, FPE of Neptune Fire Protection. A third party review by Kenneth Bush, FPE was also performed with a finding that paint spraying could be performed safely when procedures were followed as found in this new proposed chapter.
The new proposed chapter incorporates methods and procedures now found in NFPA 33 with consideration to the

INSERT IN THE ANNEX A SPRAY PERMIT RECORD FORM

Membrane Enclosure PAINT SPRAY PERMIT RECORD

DATE: _____ APPROVAL TIME: _____

WORK COMPLETION TIME: _____

VESSEL NAME: _____

CAPTAIN: _____ CONTACT PHONE: _____

Paint Mfg. & Coating to be applied_____

LOCATION

_____

A NEW PERMIT IS REQUIRED DAILY

CHECK LIST

___ All electric in use in enclosure and within 5-feet of enclosures is Class I, Div. 2 rated for a Zone 2 area.
___ No live non-Class I, Div. 2 electrical running through enclosure or five-foot safety zone is connected to any power source.
___ Exhaust Ventilation is wired safely and running.
___ Vessel, scaffolding, and paint spraying equipment are grounded.
___ Paint spraying equipment is interlocked with ventilation to shut down should ventilation not be running.
___ Vessel electrical breakers in off position & locked out and tagged.
___ Walk-through of paint spray site found housekeeping in order.
___ Debris and loose combustibles removed from enclosure.
___ 5-foot safety zone outside enclosure clear of all equipment, containers, vehicles, AC units. (Water towers to remain)
___ Fire Extinguishers are present in paint work areas.

COMPETENT PERSON_____ SIGNATURE: _____

COMBUSTIBLE GAS READINGS

Prior to start of Painting: TIME: _____ LFL Reading: _____%
Spray Painting: TIME: _____ LFL Reading: _____% Spray Painting: TIME:_____ LFL Reading: _____%

Spray Painting: TIME: _____ LFL Reading: _____% Spray Painting: TIME:_____ LFL Reading: _____%

membrane enclosure limits and the in-place OSHA requirements for safe spray painting in marine environments that must be adhered to.

33- Log #7 **Final Action:**
(5.1.7 and A.5.1.7 (New))

Submitter: Bill Galloway, Southern Regional Fire Code Development Committee
Recommendation: Revise text to read as follows: 5.1.7* Enclosed spray booths and spray rooms shall be provided with means of egress that meet the requirements of NFPA *101*, *Life Safety Code*.

A.5.1.7 Enclosed spray booths and spray rooms should be evaluated under NFPA 101 Life Safety Code 7.11 for special provisions for occupancies with high hazard contents regardless of ventilation requirements resulting in a concentration of vapors below 25% of LFL or a concentration of dust below 50% of MEC.

Substantiation: Annex note B.1 states that '…deposits of residues can ignite spontaneously or be easily ignited… Properly designed equipment can do much to lessen these hazards but cannot eliminate them.' Documentation of vapor and dust concentration below that allowed is often used as support for an argument to classify a room or area as non-hazardous.

33- Log #11 **Final Action:**
(5.5, 6.6, 6.9, A.6.2.5, and A.6.2.6)

Submitter: Steven J. Gunsel, SGTechnologies, LLC
Recommendation:
Substantiation:

33- Log #10 **Final Action:**
(7.5)

Submitter: Andras Uhlyarik, California Pulse, Inc.
Recommendation: Revise text to read as follows:

7.5 Recirculation of Exhaust.

7.5.1* Recirculation of Exhaust for VOC Abatement.

Air exhausted from spray areas shall not be recirculated unless all of the following requirements are met:

(1) Recirculation shall be allowed only for unmanned spray operations and for cascading to subsequent unmanned spray operations.

(2) Solid particulates shall be removed from the recirculated air.

(3) The concentration of vapors in the exhaust airstream shall not exceed 25 percent of the lower flammable limit.

(4) Listed equipment shall be used to monitor the concentration of vapors in all exhaust air streams.

(5) The equipment specified in 7.5.1 (4) shall sound an alarm and shall automatically shut down the spray operation if the concentration of any vapor in the exhaust airstream exceeds 25 percent of the lower flammable limit.

(6) All equipment installed to process and remove contaminants from the air exhausted from spray operations shall be approved.

7.5.2* The provisions of 7.5.1 shall not disallow recirculation of air to occupied spaces. However, other requirements addressing the toxicity and permissible exposure limits shall also apply. *(See ANSI/AIHA Z9.7, American National Standard for the Recirculation of Air from Industrial Process Exhaust Systems.)*

7.5.3* Recirculation of Exhaust for Energy Savings.

Air exhausted from manned spray operations shall not be recirculated unless all of the following requirements are met:

(1) Solid particulates shall be removed from the recirculated air.

(2) The concentration of flammable vapors in the exhaust air stream(s) shall not exceed 25 percent of the lower flammable limit.

(3) At least one interlock shall be installed to ensure that the concentration of flammable vapors in the exhaust air stream(s) does not exceed 25 percent of the lower flammable limit.

(4) The interlock(s) specified in Section 7.5.3(3) shall automatically shut down the spray operation(s) if the concentration of flammable vapors in the exhaust air stream(s) exceeds 25 percent of the lower flammable limit.

(4) The system designer shall address the applicable industrial hygiene issues.

A.7.5.3 NFPA 33 requires that the lower flammable limit in the exhaust air stream does not to exceed 25 percent. This safety philosophy applies during exhaust air recirculation. Several different technologies can be used to comply with this requirement. For example, a system designer may use an LFL monitor to ensure that LFL levels do not exceed 25 percent in the exhaust air stream. Instead of an LFL monitor the system designer may use an air flow switch in the intake duct to prove the presence of the required fresh air ventilation rate. An air flow sensor may also be used to make sure the required fresh air ventilation is provided. The system designer has to implement a safety interlock which disables the spraying apparatus if the LFL in the exhaust air stream exceeds 25 percent.

Substantiation: Reason for This Request:

The current NFPA 33 standard does not address Spray Mode exhaust recirculation for smaller spray booths like vehicle refinishing booths. Vehicle refinishing is a specific type of spraying operation, and I think it is important to accurately address it in the standard. Many of these spray booths already recirculate in other modes to save energy and implementation of Spray Mode recirculation would be quite easy. We believe that a maximum of about 80 percent recirculation is possible. This 80 percent recirculation will maintain compliance with relevant OSHA requirements.

According to the National Highway Traffic Safety Administration (NHTSA) there were 6,024,000 police-reported vehicle collisions in the US in 2007. Please keep in mind that a large percentage of traffic collisions are not reported. Please also keep in mind that each collision usually involves multiple vehicles. Industry statistics show that almost 20 percent of vehicles were considered total losses and were not repaired. Taking into consideration that some repairs are done in non heated spray booths, we can safely assume that there are at least 6,000,000 repair cycles are done in heated booths. We have an opportunity to conserve about 80 percent of the energy these booths use during the Spray Mode! We are able to realize this opportunity without significantly increasing equipment costs and without compromising safety.

The level of danger of approaching 25 percent of the LFL is negligible in an automotive finishing booth. Please see calculations below. The current vapor monitoring requirement adds unnecessary complexity to the design and maintenance of automotive spray booths:

1. Vapor monitors have to be calibrated with test gases at least every 30 days, sometimes weekly.
2. Sensors and IR lamps have to be periodically replaced.

3. There are questions about the accuracy of vapor monitoring devices when trying to use them to monitor several different sets of solvent mixtures. For example, in the vehicle refinishing industry primers, color coats and clear coats have different solvent mixtures. The worst case solvent that is used for calibration of the monitoring device in, for example, the color coat may not be present in the clear coat!

Vapor monitoring devices are not well suited for the vehicle finishing industry to prove that exhaust air stream LFL does not exceed 25%. Simpler alternatives exist to achieve the same purpose. For example, using an air flow switch to prove the presence of the required spray booth ventilation is a simple and effective method to ensure that the flammable vapor concentration in the exhaust air stream does not exceed 25 percent of the LFL. I believe that the system designer should have the freedom to choose the right interlock for a specific type of finishing operation to ensure vapor concentration will not exceed 25 percent of the LFL in the exhaust air stream.

Reasons for Wording of New Paragraph:

1. General Wording

The standard should require that the flammable vapor concentration level in the exhaust air stream(s) should not exceed 25 percent of the LFL during Spray Mode recirculation for energy saving purposes. Maintaining the flammable vapor level of the exhaust air stream(s) at not more than 25 percent of the LFL is the essential LFL safety philosophy of the standard (7.2). Applying it clearly to Spray Mode recirculation for the purposes of energy savings provides clarity and congruency. However, the standard should not specify a particular technology to maintain the LFL below 25%. There are other devices and technologies besides LFL monitors that can be used as a safety interlock to ensure that ventilation is provided to maintain the LFL in the exhaust air stream(s) below 25 percent.

2. Interlock(s) Selection

The system designer should have the freedom to decide what method to use to comply with the LFL safety philosophy of the standard. The system designer should be able to choose the interlock that ensures that the exhaust air stream concentration of flammable vapors does not exceed 25 percent of the LFL.

Our preferred interlock is an air flow switch. There are several reasons for this selection.

1. They are widely used as a ventilation interlock in the industry.
2. They can be used to prove the required ventilation rate that keeps the LFL below 25% in the exhaust air stream.
3. Their operation and integrity is easy to verify. They have a long history of use as safety interlocks. It is easy to design a control system that “sees” if the air flow switch operates or if it does not operate. The control system can look for a change of state. If the switch contacts do not change form closed to open or from open to closed state, the control system detects a fault and takes appropriate action. Change of state can be checked during every spray booth finishing cycle. If an interlock is bypassed, this can be detected during the next cycle BEFORE spraying begins. For example, the spray booth ventilation is off before the beginning of the cycle. The spray interlock air flow switch should be in an OFF position since there is no air flow. If the switch is bypassed with a jumper wire, it will be in the ON position. The system “sees” that the switch is in the incorrect position and it will not enable the use of the spray apparatus. When the Spray Mode starts and the ventilation is on, the air flow switch should turn ON. If the control system does not see this change of state, the system disables the spray apparatus.

Air flow switches are simple and reliable interlocks that are well suited to prove that flammable vapor levels do not exceed 25 percent of the LFL in the exhaust air stream. A system designer should have the option of using these in vehicle refining booths.

3. Deactivation of the Spray Apparatus

NFPA 33 2011 13.3.1.3.1 already requires the deactivation of the spraying apparatus when a spray booth is used as an oven. In the vehicle refinishing industry this is accomplished by deactivating the compressed air solenoid valve that supplies the spray gun with compressed air.

4. Reference to Industrial Hygiene Issues

Paragraph 7.5.2 refers to the ANSI/AIHA Z9.7 standard. This could stay a part of the recirculation section on VOC abatement but should not be a part of the recirculation section for energy savings.

ANSI/AIHA Z9.7 deals with recirculation of air from industrial process inside of buildings. Vehicle refinishing operations are fundamentally different from what the Z9.7 standard deals with. Building occupants do not wear respirators. Painters must wear respirators during vehicle refinishing operations since the clear coat contains isocyanates. I think NFPA 33 should note that the industrial hygiene issue has to be addressed. However, I don’t think that NFPA 33 should give guidance on how this has to be accomplished. It is the system designer’s responsibility to research and implement a method that complies with the relevant OSHA requirements. Citing Z9.7 may confuse some readers since the standard does not clearly address vehicle refinishing spray booths.

LFL and Ventilation Rate Calculation for the Spray Mode of an Automotive Spray Booth

By calculating the LFL in the Spray Mode of an automotive refinishing type booth, one sees that a very low rate of fresh air ventilation maintains the LFL below 25%. I used Table A.11.6.8.4(a) in NFPA 86, 2011 edition to find a flammable liquid with 1% LFL. I found n-Heptane (scf air at LFL per gal = 2,159) and sec-Amyl Acetate (scf air at LFL per gal =

2,169).

6 pounds per gallon of paint = V.O.C.

Weight per gallon of paint – approximately 11 pounds 6/11=54% solvent per gallon of paint

Application rate of spray gun – 12 ounces per minute

Air at LFL per gal – 2169 cfm

128 ounces per gallon

25% LFL factor – (.25)

Actual V.O.C., flammable solvents, being sprayed during booth operation:

12 oz per min x 54% solvent – 6.48 oz per minute of V.O.C. being sprayed

(6.48 oz per minute being sprayed / 128 oz per gallon) x 2169 = 110 cfm of air to maintain LFL

110 cfm to maintain LFL / (.25) = 440 cfm to maintain 25% of the LFL

Today small vehicle (automotive) spray booths ventilate at a rate of 10,000 cfm-14,000 cfm during Spray Mode! This is a large scale wasting of energy and a significant source of pollution. Please keep in mind that larger vehicle refinishing booths ventilate at much higher rates.

Addressing Concerns

1. Defeating Interlocks

There was a concern in a correspondence that "an interlock on the spray apparatus alone would not be acceptable as a means of protection; it is simply to easily defeated". I am not sure if the comment was concerning the sensor part (for example a vapor monitoring device or an air flow switch) or if it was made about the device that performs the deactivation of the spraying apparatus (in our case the air solenoid valve).

a. If the comment was made about the sensor (for example an air flow switch), I believe that paragraph #2 ,Interlock(s) Selection, above clarifies the way we intend to use an air flow switch and show that the switch is a well suited device for this purpose.,

b. If the concern was raised against using compressed air solenoid valves to deactivate the spray apparatus, I would like to make the following point. Listing agencies completed all automotive spray booth listings I know of with a compressed air solenoid means to deactivate the spray apparatus during Class A oven modes to comply with Section 13.3.1.3.1 in NFPA 33. I am not aware of any other technologies that are used in the vehicle refinishing industry to deactivate the spray apparatus. Compressed air solenoid valves used for this purpose have an extensive, successful history in the vehicle refinishing industry.

2. Issue of Solvents used in Cleaning Operations

I would like to address the concern that solvents may be spilled during cleaning operations. A large enough solvent volume could cause a safety hazard.

I called nine automotive spray booth dealers in the USA to find out how they perform cleaning services. Three were in CA, two in NC, one in PA, one in TX, one in NY and one in MD. They pointed out that there are two parts to cleaning the spray booth. The first part is the cabin and the second part is the exhaust air path. They explained that there are two types of spray booth coverings that are available for surface protection. The first one is a peelable, self adhesive membrane product. They install it onto clean surfaces. The overspray sticks to this layer. When they clean the booth, they simply peel it off the interior surfaces. The second type of product is a water soluble spray coating. Service people spray it on the internal spray booth surfaces. When they clean the booth, they use a pressure washer to wash off the coating and the overspray with it. If the booth internal surfaces were not protected with one of the products above and overspray is directly on the walls, they sand it with a DA sander and re-paint the walls. Service people apply either the self adhesive membrane or the sprayable surface coating to make future booth cleanings easy.

Many of the dealers use the water soluble coating on the internal duct surfaces also. They simply pressure wash these surfaces to remove the water soluble coating with the overspray and re-coat the duct surfaces. If the duct has not been coated with the water soluble coating, they use a tool that looks like a large diameter chimney sweep. They use a drill to rotate this tool inside the duct. Sometimes they also use wire brushes, chisels, and other scraping tools on thick deposits for example on the exhaust fan blades.

I asked the dealers directly about the use of solvents. They said that solvents don't penetrate the overspray deposits well. If the surface has not been protected with a membrane or the spray-on coating, it is the easiest to sand the overspray off. It is fast and easy to pressure wash the inside of the booth when the walls were coated with a protective layer. It is also very fast and easy to peel off the protective layer if the membrane type of booth covering was used to protect the internal surfaces from overspray.

Based on these testimonials, it seems like that there is no significant danger of creating a flammable atmosphere inside an automotive spray booth during cleaning operations.

33- Log #6 Final Action:
(7.8.2)

Submitter: Scott Adams, Western Regional Fire Code Development Committee
Recommendation: Revise text to read as follows: 7.8.2 Hangers and supports shall be fastened securely to the building structural components ~~or to the structure~~ to avoid vibration and stress on the duct system.
Substantiation: Attachment of hangers and supports to façade materials or nonstructural components could fail under fire conditions, especially when water, fans, or any additional weighting is added to the duct that results in added weight stress to the hangers and supports.

33- Log #5 Final Action:
(9.4.2)

Submitter: Kenneth E. Isman, National Fire Sprinkler Association
Recommendation: Revise Section 9.4.2 to read as follows (without revising the two exceptions):
9.4.2 The automatic sprinkler system shall be designed ~~for~~ such that the density that discharges from the sprinklers protecting the spray application are in accordance with Extra Hazard Group 2 occupancies as defined in NFPA 13. The area of operation shall be the area of the spray application booth and additional sprinklers in the adjacent ceiling are not required to be added to achieve the Extra Hazard design area.
Substantiation: NFPA 13 only provides two options for hydraulic calculations: the room design method and the density/area method. Most paint spray booths do not have the ninety minute or two-hour fire resistance rating complete with protection of openings so that the room design method can be used. This leaves the density/area method as the only option, which requires a 2500 sq ft design area to comply with the Extra Hazard rules. Since most paint spray booths are not 2500 sq ft in area, this would require additional sprinklers at the adjacent ceiling area to be added to the hydraulic calculation of the spray booth. We believe this to be an onerous requirement. The proposal was prepared on behalf of the NFSA Engineering and Standards Committee.
This is not original material; its reference/source is as follows:
Although I authored this text, I gave the rights to it to the NFPA where it appears as proposal 13-469 in the ROP for the Annual 2012 cycle.

33- Log #1 Final Action:
(9.4.3)

Submitter: Victoria B. Valentine, National Fire Sprinkler Association, Inc.
Recommendation: Delete Section 9.4.3.
Substantiation: This section does not provide the user with any additional information on installing an NFPA 13 sprinkler system. The design areas for calculation purposes are specified in NFPA 13 according to their hazard classification and including the hose stream demands. It is also noted in Section 1.1.2 of the 2010 Edition of NFPA 13 that the standard addresses a single fire incident.
If there are additional considerations that are necessary for spray applications, they should be spelled out to the user. However, if the requirements are the same as NFPA 13, the user has already been told the system needs to be installed in accordance with that document in Section 9.4.2.

33- Log #2 Final Action:
(9.4.4)

Submitter: Victoria B. Valentine, National Fire Sprinkler Association, Inc.
Recommendation: Delete Section 9.4.4.
Substantiation: The intention of this section is confusing. This system would be in accordance with NFPA 13, which requires all water supplies to be able to "meet the demand for the design criteria," but also includes other safeguards.

33- Log #3 Final Action:
(9.4.6)

Submitter: Victoria B. Valentine, National Fire Sprinkler Association, Inc.
Recommendation: Rewrite Section 9.4.6 as follows (legislative text has not been used, but part is only renumbered):

9.4.6* Duct Protection

9.4.6.1 Sprinkler systems protecting stacks or ducts shall meet the requirements of NFPA 13 Section 8.15.12.

9.4.6.2 Where exhaust ducts are manifolded, a sprinkler shall be located in the manifold at the junction of each exhaust duct with the manifold.

9.4.6.3 Each sprinkler shall provide a minimum flow of 114 L/min (30 gpm) at a minimum pressure of 1 bar (15 psi).

9.4.6.4 Sprinklers shall be ordinary temperature rated, unless required to be higher due to operating temperatures measured in the ducts, in which case the operating temperature shall be at least 28°C (50°F) above the ambient temperature in the duct.

Substantiation: NFPA 13 indicates that a sprinkler at the top of a vertical duct is sufficient as that is the travel direction of the hot gases during a fire. For horizontal exhaust ducts, it guides users to install sprinklers up to 10 ft on center. Neither of these requirements parallel the current 9.4.6(1).

Section 9.4.6.2 through 9.4.6.4 have minor editorial changes to existing language. However, these items need to be included for spray applications in addition to those in NFPA 13. The existing 9.4.6.1 (33-2011) has been deleted as it will now be handled by Section 8.15.12.3 in NFPA 13. The existing 9.4.6.2 (33-2011) has also been deleted as it is handled by Section 8.15.12.2 in NFPA 13.

33- Log #4 Final Action:
(A.9.4)

Submitter: Victoria B. Valentine, National Fire Sprinkler Association, Inc.
Recommendation: Revise Section A.9.4 as follows:

1. Change "sprinkler heads" to "sprinklers" throughout the section.
2. In the 5th paragraph, modify the spacing for extra hazard sprinklers 9.3 m^2 (100 ft^2)

Substantiation: The first change is strictly a terminology update to parallel the sprinkler standards. The second change is to match the acceptable area that is permitted for hydraulically calculated sprinkler systems. This value was changed in NFPA 13 to be 100 ft^2 many years ago and this should be modified to match.

Public Input No. 3-NFPA 33-2012 [Section No. 1.1.4]

1.1.4*

This standard shall not apply to spray operations that use less than 1 L (33.8 fl oz) of flammable or combustible liquid in any 8-hour period, except for limited finishing workstations addressed in Chapter 14.

Statement of Problem and Substantiation for Public Input

Text currently contradicts 14.3.2 which establishes requirements for spray operations that don't exceed 33.8 fl.oz. in an 8-hour period.

Submitter Information Verification

Submitter Full Name: John Chartier
Organization: Northeastern Regional Fire Cod
Submittal Date: Thu Aug 16 11:02:42 EDT 2012

Public Input No. 8-NFPA 33-2012 [Section No. 5.5]

5.5 Vision and Observation Panels.

5.5.1

Panels for ~~light fixtures~~ luminaires or for observation shall be of heat-treated glass, laminated glass, wired glass, or hammered-wired glass and shall be sealed to confine vapors, mists, residues, dusts, and deposits to the spray area.

Exception : Listed spray booth assemblies that have vision panels constructed of other materials shall be permitted.

5.5.2

Panels for ~~light fixtures~~ luminaires shall be separated from the fixture to prevent the surface temperature of the panel from exceeding 93°C (200°F).

5.5.3

The panel frame and method of attachment shall be designed to not fail under fire exposure before the vision panel fails.

5.5.4

Observation panels for spray booths that are used exclusively for powder coating processes shall be permitted to be constructed of fire-resistant combustible materials.

Statement of Problem and Substantiation for Public Input

Conformance with language and definitions in the National Electrical Code (NEC), NFPA 70.

Submitter Information Verification

Submitter Full Name: Steven Gunsel
Organization: SGTechnologies, LLC
Submittal Date: Mon Sep 24 10:04:10 EDT 2012

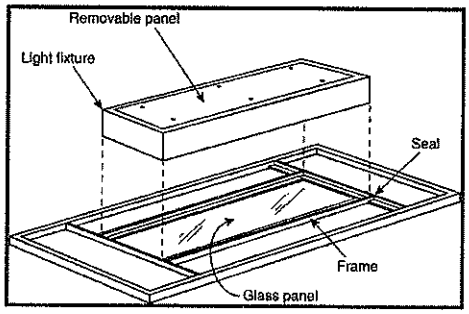
Public Input No. 9-NFPA 33-2012 [Section No. 6.6]

6.6 Light Fixtures.

6.6.1

~~Light fixtures~~ Luminaires , like that shown in Figure 6.6.1, that are attached to the walls or ceiling of a spray area but that are outside any classified area and are separated from the spray area by glass panels that meet the requirements of Section 5.5 shall be suitable for use in unclassified locations. Such fixtures shall be serviced from outside the spray area.

Figure 6.6.1 Example of a ~~Light Fixture~~ Luminaires Mounted Outside the Spray Area and Serviced from Outside the Spray Area.



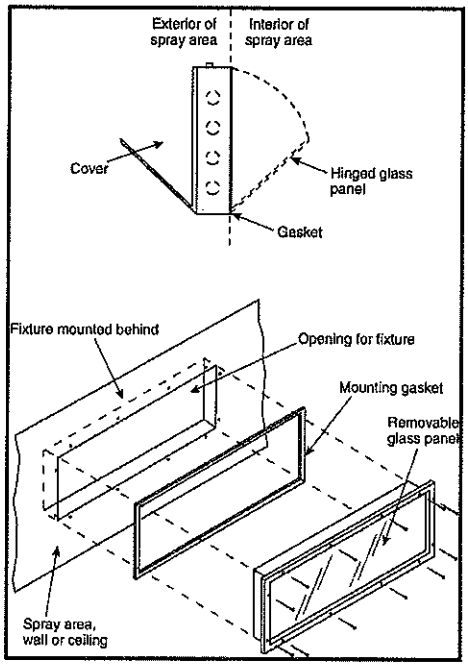
6.6.2

~~Light fixtures~~ Luminaires , like that shown in Figure 6.6.1, that are attached to the walls or ceiling of a spray area; that are separated from the spray area by glass panels that meet the requirements of Section 5.5; and that are located within a Class I, Division 2; a Class I, Zone 2; a Class II, Division 2; or a Zone 22 location shall be suitable for such location. Such fixtures shall be serviced from outside the spray area.

6.6.3

~~Light fixtures~~ Luminaires , like that shown in Figure 6.6.3, that are an integral part of the walls or ceiling of a spray area shall be permitted to be separated from the spray area by glass panels that are an integral part of the fixture. Such fixtures shall be listed for use in Class I, Division 2; Class I, Zone 2; Class II, Division 2; or Zone 22 locations, whichever is applicable, and also shall be listed for accumulations of deposits of combustible residues. Such fixtures shall be permitted to be serviced from inside the spray area.

Figure 6.6.3 Examples of ~~Light Fixtures That~~ LuminairesThat Are Integral Parts of the Spray Area and That Are Serviced from Inside the Spray Area.



6.6.4

~~Light fixtures~~ Luminaires that are located inside the spray area shall meet the requirements of Section 6.4 and Section 6.7.

Statement of Problem and Substantiation for Public Input

Conformance with language and definitions in the National Electrical Code (NEC), NFPA 70.

Submitter Information Verification

Submitter Full Name: Steven Gunsel
Organization: SGTechnologies, LLC
Submittal Date: Mon Sep 24 10:06:23 EDT 2012

Public Input No. 10-NFPA 33-2012 [Section No. 6.9]

6.9 Portable Electric Lights.

Portable electric ~~light fixtures.~~ luminaires shall not be used in any spray area while spray application operations are being conducted.

Exception : Where portable electric ~~light fixtures.~~ luminaires are required for use in spaces that are not illuminated by fixed ~~light fixtures.~~ luminaires within the spray area, they shall meet the requirements of 6.4.3.

Statement of Problem and Substantiation for Public Input

Conformance with language and definitions in the National Electrical Code (NEC), NFPA 70.

Submitter Information Verification

Submitter Full Name: Steven Gunsel
Organization: SGTechnologies, LLC
Submittal Date: Mon Sep 24 10:10:03 EDT 2012

Public Input No. 4-NFPA 33-2012 [Section No. 8.2.1.2]

8.2.1.2

For industrial occupancies, the total aggregate volume of Class I, Class II, and Class IIIA liquids in a group of storage cabinets in a single area shall not exceed the maximum allowable quantity (MAQ) of flammable and combustible liquids per control area for industrial occupancies as set forth in Table 8.2.1.2.

Table 8.2.1.2 Maximum Allowable Quantity of Flammable and Combustible Liquids per Control Area

		Quantity		
	Liquid Classes	L	gal	Notes
Flammable liquids	IA	115	30	1, 2
	IB & IC	460	120	1, 2
	IA, IB, IC combined	460	120	1, 2, 3
Combustible liquids	II	460	120	1, 2
	IIIA	1,265	330	1, 2
	II, IIIA	1265	330	1,2

Source: Table 34.1.3.1 of *NFPA 5000, Building Construction and Safety Code*, 2009 edition.

Notes:

(1) Quantities are permitted to be increased 100 percent where all liquids are stored in approved flammable liquids storage cabinets or in safety cans. Where Note 2 also applies, the increase for both notes is permitted to be applied accumulatively.

(2) Quantities are permitted to be increased 100 percent in buildings equipped throughout with an automatic sprinkler system installed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*. Where Note 1 also applies, the increase for both notes is permitted to be applied accumulatively.

(3) Containing not more than the maximum allowable quantity per control area of Class IA, Class IB, or Class IC flammable liquids, individually.

Statement of Problem and Substantiation for Public Input

To be consistent with, and follow the logic of, the preceding lines. If 331 gallons of Class IIIa liquids is unacceptable, it would seem that 330 gallons of Class IIIa liquids in addition to as much as 120 gallons of Class II liquid, which is more of a hazard, should also be considered as unacceptable.

Submitter Information Verification

Submitter Full Name: John Chartier
Organization: Northeastern Regional Fire Cod
Submittal Date: Thu Aug 16 11:04:40 EDT 2012

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Public Input No. 1-NFPA 33-2012 [Section No. 15.8.1 [Excluding any Sub-Sections]]

Where nondeposited, air-suspended powder (powder overspray) is conveyed by ductwork to a recovery system, sufficient airflow shall be provided in the ductwork to maintain the powder concentration in the ductwork at not more than 50 percent of the minimum explosive concentration (MEC) of the powder in use. Exhaust equipment shall bear an identification plate stating the ventilation rate for which it was designed.

Exception : Where, by design, the coating operation is conducted at an exhaust duct concentration above 50 percent of the MEC, listed explosion suppression equipment shall be provided or deflagration venting .

Statement of Problem and Substantiation for Public Input

Dust collectors and ductwork are typically protected from explosion by two means. Explosion suppression or venting of the deflagration, section 15.8.1 only gives you one choice. NFPA68 allows deflagration venting in ductwork, NFPA33 should allow this process when followed per NFPA68. In NFPA33 15.8.3 both types of proyection venting and suppression are allowed for the dust enclosure, I feel vents should also be allowed for the ductwork. I feel venting of the ductwork was inadvertantly omitted by the committee when drafting 15.8.1 exception.

Submitter Information Verification

Submitter Full Name: Robert Feldkamp
Organization: Nordson Corporation
Submittal Date: Thu Jun 21 14:24:51 EDT 2012

Public Input No. 11-NFPA 33-2012 [Sections A.6.2.5, A.6.2.6]

Sections A.6.2.5, A.6.2.6

A.6.2.5

There should be no open flames, hot surfaces, or spark-producing equipment in the spray area or in any area where they might be exposed to combustible residues. Open flames or spark-producing equipment should not be located where they can be exposed to deposits of combustible residues. Some residues can be ignited at low temperatures, such as those produced by steam pipes, incandescent ~~light fixtures~~ luminaires , and power tools.

A.6.2.6

Areas that are above or adjacent to spray areas and where materials are located, stored, mixed, or processed should be ventilated. Equipment that is known to produce flame, sparks, or particles of hot metal, including ~~light fixtures~~ luminaires , that are adjacent to areas that are safe under normal operating conditions but which can become dangerous due to accident or careless operation should not be installed in such areas unless the equipment is totally enclosed or is separated from the area by partitions that will prevent the sparks or particles from entering the area.

Statement of Problem and Substantiation for Public Input

Conformance with language and definitions in the National Electrical Code (NEC), NFPA 70.

Submitter Information Verification

Submitter Full Name: Steven Gunsel
Organization: SGTechnologies, LLC
Submittal Date: Mon Sep 24 10:11:06 EDT 2012

Public Input No. 2-NFPA 33-2012 [Section No. A.15.8.1]

A.15.8.1

Where a listed explosion suppression system is used, refer to NFPA 69, *Standard on Explosion Prevention Systems.*

Where a deflagration vent is used, refer to NFPA68, *Standard on Explosion Protection by Deflagration Venting* .

Statement of Problem and Substantiation for Public Input

This adds the additional information to the Annex for the proposed change to the 15.8.1 text in the body of the document.

Submitter Information Verification

Submitter Full Name: Robert Feldkamp
Organization: Nordson Corporation
Submittal Date: Thu Jun 21 14:46:03 EDT 2012

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☑ By checking this box I affirm that I am Robert Feldkamp, and I agree to be legally bound by the above Copyright Assignment and the terms and conditions contained therein. I understand and intend that, by checking this box, I am creating an electronic signature that will, upon my submission of this form, have the same legal force and effect as a handwritten signature

34- Log #1 Final Action:
(4.2)

Submitter: Jim Muir, Clark County Building Safety Division / Rep. NFPA Building Code Development Committee (BCDC)
Recommendation: Revise text to read as follows:
4.2* Separation. Processes shall be separated from other operations, materials, or occupancies by location, ~~fire walls, fire partitions,~~ fire barrier walls, and horizontal assemblies in accordance with NFPA 5000, or other means acceptable to the authority having jurisdiction.
Substantiation: Note: This proposal was developed by the proponent as a member of NFPA's Building Code Development Committee (BCDC) with the committee's endorsement.
This proposal will provide the AHJ with direction in complying with the intent of these provisions. The separations that would likely be utilized are fire barrier walls and horizontal assemblies which are defined terms in NFPA 5000. Fire walls are likely not to be used because it is an excessive minimum requirement. Fire partition is not a defined term and does not provide any guidance. This proposal uses terms from the NFPA 5000 which are defined and provide guidance to the AHJ.

34- Log #8 Final Action:
(6.7)

Submitter: Steven J. Gunsel, SGTechnologies, LLC
Recommendation:
Substantiation:

34- Log #4 Final Action:
(7.5.5 (New))

Submitter: Gantry Andrade, Hawaii Fire Department
Recommendation: Add a new section to read:
7.5.5 Exhaust ducts shall not discharge within 25 feet of any exiting system.
Substantiation: 1. Current language does not cover this life safety issue. Particularly in Section 4.3 which allows this type of operation below grade.
2. 25 feet is consistent with 7.5.3 and 7.5.4 which covers discharge clearance to combustible construction and unprotected openings.

34- Log #2 Final Action:
(7.6.2)

Submitter: Jim Muir, Clark County Building Safety Division / Rep. NFPA Building Code Development Committee (BCDC)
Recommendation: Revise text to read as follows:
7.6.2* ~~The provisions in 7.6.1 shall not prohibit the~~ Any use of recirculated air to occupied spaces~~. In such cases, however, other requirements addressing~~ shall comply with applicable toxicity and permissible exposure limits ~~shall apply~~. (See ANSI/AIHA Z9.7, American National Standard for the Recirculation of Air from Industrial Process Exhaust Systems.)
Substantiation: Note: This proposal was developed by the proponent as a member of NFPA's Building Code Development Committee (BCDC) with the committee's endorsement.
This section is not clear as written. This proposal intends to clarify the section based on the information found in the annex.

34- Log #3 Final Action:
(7.7 and 7.8)

Submitter: Jim Muir, Clark County Building Safety Division / Rep. NFPA Building Code Development Committee (BCDC)
Recommendation: Revise text to read as follows:

7.7 Materials of Construction. Exhaust ducts and fasteners shall be designed and constructed in accordance with the requirements of NFPA 91~~ of steel~~.

~~Exception: Other materials of construction shall be permitted to be used in cases where the conveyed materials are not compatible with steel.~~

~~7.8 Support of Exhaust Ducts.~~

~~Exhaust ducts shall be supported to prevent collapse under fire conditions.~~

~~7.8.1 Duct supports shall be designed to carry the weight of the duct system itself, plus the anticipated weight of any residues. If sprinkler protection is provided inside the duct system, the duct supports also shall be designed to carry the anticipated weight of any accumulation of sprinkler discharge.~~

~~7.8.2 Loads shall not be placed on or transmitted to equipment connected to the duct system.~~

~~7.8.3 Hangers and supports shall be securely fastened to the building or to the structure to avoid vibration and stress on the duct system.~~

~~7.8.4 Hangers and supports shall be designed to allow for expansion and contraction.~~

~~7.8.5 Exhaust ducts shall not use building walls, floors, ceilings, or roofs as component parts.~~

Substantiation: Note: This proposal was developed by the proponent as a member of NFPA's Building Code Development Committee (BCDC) with the committee's endorsement.

Section 7.7 is recommended to be revised to refer to NFPA 91, which addresses combustibility and compatibility in Section 4.2. Section 7.8 is recommended to be revised to refer to NFPA 91, which also contains provisions in Section 4.5 for the support of ducts. This provides consistency with the NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids.*

34- Log #7 Final Action:
(9.11.1.1 Exception)

Submitter: Gantry Andrade, Hawaii Fire Department
Recommendation: Revise text to read:

Exception: Where an automatic carbon dioxide extinguishing system ~~protection~~ is provided for ~~such~~ areas where no ordinary combustible are present, sprinklers are not required.

Substantiation: 1. The existing language can be interpreted as if a portable CO2 fire extinguisher was present, sprinklers are not required.

2. CO2 fire extinguishers should not replace sprinklers in areas that contain ordinary combustibles. CO2 extinguishers is primarily used for Class B;C fires.

34- Log #5 Final Action:
(10.3.1.3 (New))

Submitter: Gantry Andrade, Hawaii Fire Department
Recommendation: Add a new section to read:

10.3.1.3 Waste materials shall not exceed 80 percent capacity of the container.

Substantiation: There are no limit or restrictions on the waste storage amount, the size of waste storage container, or the storage amount within the container. If this is not addressed, these waste containers may be overfilled and will not close properly, defying the purpose of the container in the first place.

34- Log #6 Final Action:
(10.3.5 (New))

Submitter: Gantry Andrade, Hawaii Fire Department
Recommendation: Add a new section to read:
10.3.5 Waste containers shall not be stored within 10 feet of any exiting system.
Substantiation: Current language does not cover safe locations for waste storage containers. Per Annex 10.3, many fires start this way. As such, waste containers should not be stored near any exit, especially if operations are conducted below grade (4.3). In spontaneous combustion type fires, smoke usually occurs first. Smoke or subsequent fire will render an exit useless if it is stored too close.

Public Input No. 10-NFPA 34-2012 [Section No. 6.7]

6.7 Light Fixtures.

6.7.1

~~Light fixtures~~ Luminaires that are attached to the walls or ceilings of a process enclosure but are outside any classified area and are separated from the process area by glass panels that meet the requirements of 5.2.2 shall be suitable for use in ordinary hazard (general purpose) locations. Such fixtures shall be serviced from outside the enclosure.

6.7.2

~~Light fixtures~~ Luminaires that are attached to the walls or ceilings of a process enclosure, are located within the Class I, Division 2 or Class I, Zone 2 location, and are separated from the process area by glass panels that meet the requirements of 5.2.2 shall be suitable for use in that location. Such fixtures shall be serviced from outside the enclosure.

Statement of Problem and Substantiation for Public Input

Conformance with language and definitions in the National Electrical Code (NEC), NFPA 70.

Submitter Information Verification

Submitter Full Name: Steven Gunsel

Organization: SGTechnologies, LLC

Submittal Date: Mon Sep 24 10:12:51 EDT 2012

Public Input No. 5-NFPA 34-2012 [New Section after 7.5.4]

7.5.5 Exhaust ducts shall not discharge in the direction of any exit that is within 7620mm(25 ft) of the discharge point.

Statement of Problem and Substantiation for Public Input

For consistency with other sections of the standard on where discharge can or can't be. The proposed text prevents discharge in the area of exits. 7.5.4 has a requirement of no discharge within 25 feet of openings.

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: Western Regional Fire Code Dev
Submittal Date: Thu Aug 16 11:32:35 EDT 2012

Public Input No. 3-NFPA 34-2012 [Section No. 7.7]

7.7 Materials of Construction.

Exhaust ducts and fasteners shall be constructed of steel.

Exception : Other materials of construction acceptable to the AHJ shall be permitted to be used in cases where the conveyed materials are not compatible with steel.

Statement of Problem and Substantiation for Public Input

Ideally, the duct should be steel. And although some combustible materials, like heavy gauge, dense plastics may be acceptable, the exception should not be a carte-blanche to use any combustible material, such as wood.

Submitter Information Verification

Submitter Full Name: John Chartier
Organization: Northeastern Regional Fire Cod
Submittal Date: Thu Aug 16 11:07:44 EDT 2012

Public Input No. 4-NFPA 34-2012 [Section No. 9.2]

9.2* General.

~~Where required by~~ Except where specifically permitted to be omitted by the authority having jurisdiction, areas in which dipping or coating operations are conducted shall be protected with approved automatic sprinkler systems that are designed and installed in accordance with the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems.*

Statement of Problem and Substantiation for Public Input

For all the good reasons expressed in A.9.2 for providing sprinklers, the norm should be to provide sprinklers unless there is a compelling reason for the AHJ to omit them.

Submitter Information Verification

Submitter Full Name: John Chartier
Organization: Northeastern Regional Fire Cod
Submittal Date: Thu Aug 16 11:09:11 EDT 2012

Public Input No. 9-NFPA 34-2012 [Section No. 9.11.1]

9.11.1 Automatic Sprinklers.

9.11.1.1*

Automatic sprinkler protection shall be provided for the following areas:

(1) All printing process areas that contain ordinary combustibles, flammable or combustible liquids, or combustible construction

(2) All printing operations areas, at the ceiling level

(3) Areas of printing presses that are shielded from ceiling sprinklers and where combustibles exist

Exception : ~~Where carbon dioxide protection~~ . When approved by the AHJ, sprinklers are not required where an alternative fire protection system is provided for such areas ~~, sprinklers are not required~~ .

Statement of Problem and Substantiation for Public Input

Rewords the exception to permit with the approval of the ahj other types of fire protection systems to protect the area i.e. 12, 750.

Submitter Information Verification

Submitter Full Name: Kelly Nicolello

Organization: Western Regional Fire Code Dev

Submittal Date: Thu Aug 16 11:37:53 EDT 2012

Public Input No. 8-NFPA 34-2012 [Section No. 9.11.1.1]

9.11.1.1*

Automatic sprinkler protection shall be provided for the following areas:

(1) All printing process areas that contain ordinary combustibles, flammable or combustible liquids, or combustible construction

(2) All printing operations areas, at the ceiling level

(3) Areas of printing presses that are shielded from ceiling sprinklers and where combustibles exist

Exception : Where carbon dioxide ~~protection~~ system is provided for such areas, sprinklers are not required.

Statement of Problem and Substantiation for Public Input

clarifies that the exception only applies if a systems is installed not a portable fire extinguisher.

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: Western Regional Fire Code Dev
Submittal Date: Thu Aug 16 11:36:48 EDT 2012

Public Input No. 6-NFPA 34-2012 [New Section after 10.3.1.2]

10.3.1.3 Waste materials shall not exceed the capacity of the waste container.

Statement of Problem and Substantiation for Public Input

The proposed text prohibits waste container from being overfilled which could constitute a fire hazard or the lids not closing.

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: Western Regional Fire Code Dev
Submittal Date: Thu Aug 16 11:33:30 EDT 2012

Public Input No. 7-NFPA 34-2012 [New Section after 10.3.4]

10.3.5 Waste containers shall be located so that, in the event of a fire originating at or within the waste containers, access to means of egress will not be impaired.

Statement of Problem and Substantiation for Public Input

The text is consistent with 4.4. Clarifies that the placement of waste containers not be placed where it would impede a means of egress in the event of a fire.

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: Western Regional Fire Code Dev
Submittal Date: Thu Aug 16 11:35:16 EDT 2012

Public Input No. 2-NFPA 34-2012 [Section No. 12.1.4]

12.1.4

~~Some appropriate form of documentation shall be employed to record the~~ Records shall be maintained, recording initial and refresher training, with the type and date of training provided to each individual involved in these processes.

Statement of Problem and Substantiation for Public Input

More dirrect in the wording. Do not like the wording "Some appropriate form". Who desides what form is appropriate? The idea is for training to be done and records to be kept. I tried to reword this to express that idea.

Submitter Information Verification

Submitter Full Name: Robert Feldkamp
Organization: Nordson Corporation
Submittal Date: Thu Aug 02 09:40:48 EDT 2012

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Public Input No. 1-NFPA 34-2012 [Section No. A.12.1]

A.12.1

The safety of a dipping or coating process depends on the employees who operate it and the knowledge and understanding they have of the process and equipment involved. It therefore is important to maintain an effective and ongoing training program for all employees involved in such work. New employees should be effectively trained before being assigned to a job. After the initial training, employees should receive periodic retraining to ensure their knowledge and understanding of normal process procedures, as well as emergency procedures or changes in procedures. Safe work habits should be developed; they do not occur naturally.

All training should be provided by qualified personnel knowledgeable in the process and operations involved. Appropriate training should be provided for all employees involved in, or affected by, dipping, coating and ~~coating processes~~ printing processes . This includes, but is not limited to, operating, supervisory, housekeeping, and maintenance personnel.

Statement of Problem and Substantiation for Public Input

When section 12.1 was revised during the last cycle to add printing processes, A.12.1 was not updated.

Submitter Information Verification

Submitter Full Name: Robert Feldkamp
Organization: Nordson Corporation
Submittal Date: Tue Jul 24 10:16:48 EDT 2012

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