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## MEMORANDUM

To: NFPA Technical Committee on Electronic Computer Systems

From: Elena Carroll, Administrator, Technical Projects

Date: December 2, 2011

Subject: NFPA 75 Proposed Tentative Interim Amendment (TIA) No.1042

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The attached proposed Tentative Interim Amendment (TIA) is being submitted to you for letter ballot. This proposed TIA was submitted by Thomas Wysocki and endorsed by Ralph Transue.

This proposed TIA will be published for public comment in the December 2, 2011 issue of *NFPA News* with a Public Comment Closing Date of January 13, 2012. Any public comments received will be circulated to the committee. The Standards Council will consider the issuance of this TIA at their March 5 – 6, 2012 meeting.

In addition to being balloted on the technical merits of the proposed TIA, the Committee is also being balloted on whether or not this matter is of an emergency nature. Please see Section 5 (copy enclosed) regarding the processing of TIAs from the *NFPA Regulations Governing Committee Projects*.

Please complete and return your ballot as soon as possible but no later than **December 16, 2011**. As noted on the ballot form, please return the ballot to Elena Carroll either via e-mail to [ecarroll@nfpa.org](mailto:ecarroll@nfpa.org) or via fax to 617-984-7110. You may also mail your ballot to the attention of Elena Carroll at NFPA, 1 Batterymarch Park, Quincy, MA 02169.

*Note: Please remember that the return of ballots and attendance at committee meetings are required in accordance with the NFPA Regulations Governing Committee Projects.*

Attachments

## **Section 5 Tentative Interim Amendments.**

### **5.1 Preliminary Determination of Compliance.**

A Tentative Interim Amendment (TIA) to any Document may be processed if the Council Secretary determines, after a preliminary review, and consultation with the appropriate Chair, that the Amendment appears to be of an emergency nature requiring prompt action and has the endorsement of at least two Members of the involved TC or TCC. If processed, the question of emergency nature shall be considered by the TC and TCC. The text of a proposed Tentative Interim Amendment may be processed as submitted or may be changed, but only with the approval of the submitter.

**5.2 Evaluation of Emergency Nature.** Determination of an emergency nature shall include but not be limited to one or more of the following factors:

(a) The document contains an error or an omission that was overlooked during a regular revision process.

(b) The document contains a conflict within the document or with another NFPA document.

(c) The proposed TIA intends to correct a previously unknown existing hazard.

(d) The proposed TIA intends to offer to the public a benefit that would lessen a recognized (known) hazard or ameliorate a continuing dangerous condition or situation.

(e) The proposed TIA intends to accomplish a recognition of an advance in the art of safeguarding property or life where an alternative method is not in current use or is unavailable to the public.

(f) The proposed TIA intends to correct a circumstance in which the revised document has resulted in an adverse impact on a product or method that was inadvertently overlooked in the total revision process, or was without adequate technical (safety) justification for the action.

### **5.3 Publication of Proposed Tentative Interim Amendment.**

A proposed Tentative Interim Amendment that meets the provisions of 5.1 shall be published by the Association in appropriate media with a notice that the proposed Tentative Interim Amendment has been forwarded to the responsible TC and TCC for processing and that anyone interested may comment on the proposed Tentative Interim Amendment within the time period established and published.

### **5.4 Technical Committee and Technical Correlating Committee Action.**

(a) The proposed Tentative Interim Amendment shall be submitted for ballot and comment of the TC in accordance with 3.3.4. The TC shall be separately balloted on both the technical merits of the amendment and whether the amendment involves an issue of an emergency nature. Such balloting shall be completed concurrently with the public review period. Any public comments inconsistent with the vote of any TC Member shall be circulated to the TC to allow votes to be changed. A recommendation for approval shall be established if three-fourths of the voting Members calculated in accordance with 3.3.4.5 have voted in favor of the Tentative Interim Amendment.

(b) The proposed Tentative Interim Amendment shall be submitted for ballot and comment of the TCC, if any, which shall make a recommendation to the Council with respect to the disposition of the Tentative Interim Amendment. The TCC shall be separately balloted on both the merits of the amendment (as it relates to the TCC

authority and responsibilities in accordance with 3.4.2 and 3.4.3) and whether the amendment involves an issue of an emergency nature. Any public comments inconsistent with the vote of any TC or TCC Member shall be circulated to the 28 TCC to allow votes to be changed. A recommendation for approval shall be established if three-fourths of the voting Members calculated in accordance with 3.3.4.5 have voted in favor of the Tentative Interim Amendment.

(c) All public comments, ballots, and comments on ballot on the proposed Tentative Interim Amendment shall be summarized in a staff report and forwarded to the Council for action in accordance with 5.5.

**5.5 Action of the Council.** The Council shall review the material submitted in accordance with 5.4(c), together with the record on any Appeals (see 1.6, 1.6.1), and shall take one of the following actions:

(a) Issue the proposed Tentative Interim Amendment

(b) Issue the proposed Tentative Interim Amendment as amended by the Council

(c) Where acted on concurrently with the issuance of a new edition of the Document to which it relates, issue the Tentative Interim Amendment as part of the new edition;

(d) Reject the proposed Tentative Interim Amendment

(e) Return the proposed Tentative Interim Amendment to the TC with appropriate instruction

(f) Direct a different action

**5.6 Effective Date of Amendment.** Tentative Interim Amendments shall become effective 20 days after Council issuance unless the President determines, within his or her discretion, that the effective date shall be delayed pending the consideration of a Petition to the Board of Directors (see 1.7). The President may also, within his or her discretion, refer the matter of a delay in the effective date of the TIA to the Executive Committee of the Board of Directors or to the Board of Directors.

**5.7 Publication of Amendment.** The Association shall publish in one of its publications sent or accessible to all Members notice of the issuance of each Tentative Interim Amendment and may, as appropriate, issue a news release to applicable and interested technical journals. The notice and any news release shall indicate the tentative character of the Tentative Interim Amendment. In any subsequent distribution of the Document to which the Tentative Interim Amendment applies, the text of the Tentative Interim Amendment shall be included in a manner judged most feasible to accomplish the desired objectives.

**5.8 Applicability.** Tentative Interim Amendments shall apply to the document existing at the time of issuance. Tentative Interim Amendments issued after the proposal closing date shall also apply, where the text of the existing document remains unchanged, to the next edition of the Document. Tentative Interim Amendments issued concurrently with the issuance of a new edition shall apply to both the existing and new edition.

**5.9 Subsequent Processing.** TC responsible for the Document or part of the Document affected shall process the subject matter of any Tentative Interim Amendment as a proposal for the next edition of the Document (see 3.3).

**5.10 Exception.** When the Council authorizes other procedures for the processing and/or issuance of Tentative Interim Amendments, the provisions of this Section shall not apply.

## NFPA 75-2009

*Standard for the Protection of Information Technology Equipment*

**TIA Log No.** 1042

**Reference:** 10.4.4 and A.10.4.4

**Comment Closing Date:** January 13, 2012

**Submitter:** Thomas Wysocki, Guardian Services, Inc.

*1. Delete subsection 10.4.4 and Annex A.10.4.4.*

**Submitter's Substantiation:** NFPA 75 sets forth the minimum requirements for the protection of information technology equipment and information technology equipment areas from damage by fire or its associated effects — namely, smoke, corrosion, heat, and water.

**NFPA 75 TC Considerations** During preparation of the 2009 edition of NFPA 75, Section 10.4.4 which is referenced as an extraction from NFPA 70 Article 645 was updated per the NFPA extraction policy to include a provision from NEC Article 645 that under raised floors *“The ventilation system shall be so arranged, with approved smoke detection devices, that upon the detection of fire or products of combustion in the underfloor space, the circulation of air will cease.”*

A problem with this is that in preparation of the 2003 edition of NFPA 75 while developing CP46, the Technical Committee specifically considered and rejected this sentence requiring cessation of air flow upon detection of fire or products of combustion. The meeting minutes from January 24 & 25, 2001 note the discussion and rejection of the subject sentence. The subject paragraph in the 2003 edition of NFPA 75 reads: *“(3) Ventilation in the underfloor area is used for the information technology equipment room only.”*

The 2003 action of the NFPA 75 technical committee to omit the NEC requirement was purposeful and intended by the NFPA 75 Technical Committee. The addition of the sentence in the 2009 edition was not intended by the NFPA 75 Technical Committee and is an undesired consequence of the application of the NFPA extraction policy. The requirement which this sentence adds can, if enforced, have serious negative consequences.

In order to remove this requirement from NFPA 75 the entire NEC extraction of Section 10.4.4 must be deleted. This will not cause any unintended consequences as the desired provisions for wiring under the raised floor of an IT facility contained in 10.4.4 as extracted from NFPA 70 Article 645 are covered in section 10.3.1 of NFPA 75 2009 Edition.

### **Consequences of the Unwanted Requirement**

Today's IT servers run applications that are critical to business continuity and frequently have life safety implications. Unplanned shutdown of the IT equipment can cause loss of control over life support systems, emergency response systems, security systems and loss of essential data in process. Therefore, it may be undesirable – or even dangerous - to automatically shut down equipment that is not directly involved in a fire.

Modern server racks contain multiple processing units which can create a large amount of heat. If air conditioning equipment used to cool the servers is shut down, temperatures can increase by as much as 40 degrees in a matter of minutes, potentially causing more damage than the heat of a small electronic fire. Therefore, it is desirable to maintain cooling air flow for as long as possible.

Thermal overload devices are built in to servers to immediately depower components in an attempt to prevent permanent equipment damage. But permanent equipment damage from complete cessation of cooling air flow to operating IT equipment is nonetheless possible. Plus, the sudden loss of function due to equipment shutdown from thermal overload can have serious consequences.

**Relation to Fire Suppression** Fire suppression systems used in IT facilities are often designed to detect and extinguish fire in its incipient stage while cooling air flow through the facility is maintained and servers remain running. If depowering of equipment is required as part of the fire protection, such depowering is generally done in a planned, programmed sequence to minimize loss of data. When an IT facility is providing support or control related to life safety or security, the depowering sequence typically includes provision to transfer support or control functions to a backup IT

facility. Determination of when it is safe to shut off ventilation to the IT equipment is part of the planned depowering sequence.

**Air Flow Affects Detection** In IT facilities protected by automatic gaseous extinguishing systems, the activation of more than one detector is usually required to confirm existence of fire and thereby release the fire extinguishing gas. Air flow is taken into account in locating smoke detectors. Cessation of normal air flow upon activation of a single smoke detector can delay the activation of additional smoke detectors in the IT facility and thereby delay release of automatic gaseous extinguishing agent in facilities equipped with such systems.

**Summary of Technical Merit** The NFPA 75 technical committee understood the risks of automatically stopping the flow of cooling air under a raised floor upon first detection of fire or products of combustion under the raised floor when they declined to add the sentence to the 2003 edition of the standard.

Due to ever increasing heat loads in modern data centers, these risks are more serious today than they were when the 2003 edition of NFPA 75 was developed. NFPA 75 edition 2009 contains other requirements and guidance for proper control of air handling systems in IT facilities. These requirements should remain. But the unwanted requirement for shut down of air flow through the underfloor space upon detection of smoke or fire must be deleted from the 2009 edition of the standard. Because the NFPA extraction policy directs that editing of extracted text be confined to making style consistent with that of the document containing the extract, it is necessary to remove the entire 10.4.4 in order to delete this unwanted requirement.

The decision on how and when to shut down air flow should be left to the facility design engineer and operations management using the guidance given in NFPA Standard 75 and guidance given in standards covering the specific fire suppression system employed in the facility.

**Emergency Nature:** Removal of this sentence from NFPA 75 edition 2009 is an urgent matter requiring the emergency action of a TIA because:

- 1) NFPA 75 Edition 2009 is currently being enforced in many jurisdictions. End users are being forced by some AHJs to shutdown cooling airflow under the raised floor and into the IT equipment upon first detection of fire or products of combustion under the raised floor or be refused an occupancy permit. The choice is between operating the facility and risking unnecessary damage to equipment and/or loss of IT function or not operating the facility.
- 2) In facilities protected by gaseous extinguishing systems, the release of the gaseous extinguishing system may be delayed if air flow through space under the raised floor ceases upon activation of a single smoke detector. Such delay in the release of gaseous agent can unnecessarily increase the amount of fire damage before the extinguishing system is activated.
- 3) Many IT facilities utilize very early warning smoke detection capable of detecting minute quantities of smoke thus permitting effective programmatic intervention before fire poses serious risk of equipment damage or interruption of functionality. Requiring shut down of cooling air flow upon detection of smoke under such conditions defeats this very efficacious response to fire.
- 4) Since NFPA 75 edition 2009 has already been processed, the TIA is the only means available to remove the unwanted sentence.

Members of the ELT technical committee responsible for NFPA 75 have submitted a proposal to the NEC code making panel to delete the same sentence, a performance requirement, from Article 645. The proposal was approved by vote of the ELT Technical Committee by a vote of 18 affirmative 1 negative.