



**National Fire Protection Association**

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**MEMORANDUM**

**TO:** NFPA Technical Correlating Committee on Fire and Emergency Services  
Protective Clothing and Equipment

**FROM:** Stacey Van Zandt

**DATE:** March 24, 2011

**SUBJECT:** NFPA 1801 ROP TCC Letter Ballot (A2012)

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In accordance with the NFPA Regulations Governing Committee Projects, attached is the Letter Ballot on the Report on Proposals (ROP) for the 2013 Edition of NFPA 1801.

Since there were no TCC Notes only the Letter Ballot Authorizing the Release of the Report is attached.

Negative votes are limited to subjects within the purview of the TCC. Opposition on a strictly technical basis is not sufficient grounds for substantiating a negative vote. If you do have correlation issues please identify and describe your concerns.

Please complete and return your ballot as soon as possible but no later than April 7, 2011. As noted on the ballot form, please return the ballot to Stacey Van Zandt via e-mail to [svanzandt@nfpa.org](mailto:svanzandt@nfpa.org) or via fax to 617-984-7056. You may also mail your ballot to the attention of Stacey Van Zandt at NFPA, 1 Batterymarch Park, Quincy, MA 02169.

The return of ballots is required by the Regulations Governing Committee Projects.

Attachment: ROP Ballot Form

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1801-1 Log #2 FAE-ELS  
(Table 4.3.9)

**Final Action: Accept in Principle**

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**Submitter:** Landon Borders, Bullard

**Recommendation:** Revise table as follows:

\*\*\*\*Insert Table 4.3.9 Here\*\*\*\*

**Substantiation:** Remove the FOV test from specimens 1-3. This is redundant and unnecessary since it will be tested on specimens 7-9. Modify specimen requirements for the vibration test to be consistent with the Heat Resistance specimen requirements.

**Committee Meeting Action:** **Accept in Principle**

Revise Table 4.3.9 as follows:

\*\*\*\*Insert Table 4.3.9 Here\*\*\*\*

**Committee Statement:** This is a more effective testing process to run the FOV test earlier rather than later.

**Number Eligible to Vote:** 21

**Ballot Results:** Affirmative: 16

**Ballot Not Returned:** 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.

**Table 4.3.9 Test Matrix for Thermal Imagers**

Test Order	Specimens 1-3	Specimens 4-6	Specimens 7-9	Specimens 10-12	Specimens 13-15	Specimens 16-18
1	Field of View Measurement Section 8.11 Specimens 1-3	Cable Pullout Test Section 8.9 Specimens 4-6	Field of View Measurement Section 8.11 Specimens 7-9	Heat Resistance Test Section 8.6 Specimen 10	Vibration Test Section 8.2 Specimens 13-15	Durability Test Section 8.13 Specimens 16-18
2	Image Recognition Test Section 8.1 Specimens 1-3	Impact Acceleration Resistance Test — Ambient Section 8.3 Specimen 4	Corrosion Test Section 8.4 Specimens 7-9	Heat Resistance Test Section 8.6 Specimen 11	Vibration Test Section 8.2 Specimens 13-15	Product Label Durability Test Section 8.8 Specimens 16-18
3	Image Color and Effective Temperature Range Test Section 8.10 Specimens 1-3	Impact Acceleration Resistance Test — Cold Section 8.3 Specimen 5	Product Label Durability Test Section 8.8 Specimens 7-9	Heat Resistance Test Section 8.6 Specimen 12	Vibration Test Section 8.2 Specimens 13-15	—
4	Thermal Sensitivity Test Section 8.12 Specimens 1-3	Impact Acceleration Resistance Test — Elevated Temperature Section 8.3 Specimen 6	—	Product Label Durability Test Section 8.8 Specimens 10-12	—	—
5	Heat and Flame Test Section 8.7 Specimen 1-3	—	—	—	—	—

**Table 4.3.9 Test Matrix for Thermal Imagers**

Test Order	Specimens 1-3	Specimens 4-6	Specimens 7-9	Specimens 10-12	Specimens 13-15	Specimens 16-18
1	Field of View Measurement Section 8.11 Specimens 1-3	Cable Pullout Test Section 8.9 Specimens 4-6	Field of View Measurement Section 8.11 Specimens 7-9	Heat Resistance Test Section 8.6 Specimen 10	Vibration Test Section 8.2 Specimen 13	Durability Test Section 8.13 Specimens 16-18
2	Image Recognition Test Section 8.1 Specimens 1-3	Impact Acceleration Resistance Test — Ambient Section 8.3 Specimen 4	Corrosion Test Section 8.4 Specimens 7-9	Heat Resistance Test Section 8.6 Specimen 11	Vibration Test Section 8.2 Specimen 14	Product Label Durability Test Section 8.8 Specimens 16-18
3	Image Color and Effective Temperature Range Test Section 8.10 Specimens 1-3	Impact Acceleration Resistance Test — Cold Section 8.3 Specimen 5	Product Label Durability Test Section 8.8 Specimens 7-9	Heat Resistance Test Section 8.6 Specimen 12	Vibration Test Section 8.2 Specimens 15	—
4	Thermal Sensitivity Test Section 8.12 Specimens 1-3	Impact Acceleration Resistance Test — Elevated Temperature Section 8.3 Specimen 6	—	Product Label Durability Test Section 8.8 Specimens 10-12	—	—
5	Heat and Flame Test Section 8.7 Specimen 1-3	—	—	—	—	—

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1801-2 Log #CP1 FAE-ELS  
(Chapters 6, 7 and 8)

Final Action: Accept

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Submitter: Technical Committee on Electronic Safety Equipment,  
Recommendation:

\*\*\*\*Include-1801-CP1\*\*\*\*

**Substantiation:** The recommendation is the text of TIA Log No. 1018) which was submitted to the NFPA Standards Council for approval at its February 28, 2011 meeting.

The substantiation's for each change are as follows (from the TIA):

6.6.4.4.3 refers to the internal electronics heat indicator. There is no description of the indicator in the current document however it exists in the current document in Figure

6.6.4. It was proposed to be deleted as per ROP-54 submitted by Kovac whose recommendation was to delete the entire symbol. The committee action on ROP-54 was accepted in principal as it included many items in one submission. As a result the internal electronics overheat indicator remains in the current edition of NFPA 1801-2010, but is not described.

6.6.4.7.2 There is no written description of the TI BASIC PLUS operational format indicator in the standard as it is currently written. This change is requested to remain consistent with the written descriptions of all other icons and indicators that exist in the standard as pictured in Figures 6.6.3 and 6.6.4. Also, 6.6.4.7.1 indicates that the TI BASIC PLUS operational format indicator is a requirement, 6.6.4.7.4 indicates when the TI BASIC PLUS operational format indicator shall be displayed, and TI BASIC PLUS operational format indicator is pictured in figures 6.6.3 and 6.6.4

7.1.4 The parts of the Effective Temperature Range Test that involve testing for pixel saturation should be removed because they result in erroneous information.

8.1.6.7 This test is only done at one temperature so the text is not relevant.

8.1.6.10.1 More exact definition of the pixels to be used to calculate the parameters  $C_i$ ,  $CTF_i$ , and  $i$ . Necessary to give reproducible results. Figure 8.1.6.10.1(a) was added to give a visual representation of the description in 8.1.6.10.1.

8.1.6.12 The meaning of  $CTF_1$  should be included in this paragraph to provide additional relevant information.

8.1.6.19 The meaning of the C value should be included in this paragraph to provide additional relevant information.

8.10.4.3.1 The apparatus for the effective temperature range test requires that the stability of the blackbody temperatures shall not exceed the specified temperature.

8.10.5.8 The procedure for testing image capturing software and hardware requires a download rate as specified.

8.10.6.7, 8.10.6.8, 8.10.6.9 , 8.10.6.10 In the image color procedure this color is defined as having a luminosity as specified.

8.10.7.7 and 8.10.8 The parts of the Effective Temperature Range Test that involve testing for pixel saturation should be removed because they result in erroneous information.

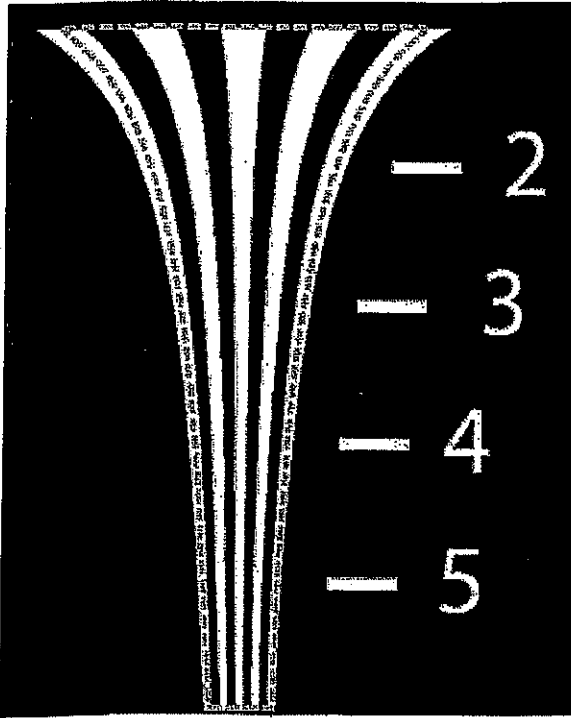
8.12.4.6 The reference to the combined area of the emitting surface is incorrect, and should be deleted.

**Committee Meeting Action: Accept**

**Number Eligible to Vote: 21**

**Ballot Results: Affirmative: 16**

**Ballot Not Returned: 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.**



1801-2, Log # CP1

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1801-3 Log #3 FAE-ELS  
(7.1.7)

**Final Action: Reject**

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**Submitter:** Landon Borders, Bullard

**Recommendation:** Delete the following text:

~~7.1.7 Thermal imagers shall be tested for ingress protection (IP) rating as specified in IEC 60529, Degrees of protection provided by enclosures (IP Code), and shall have a rating of IP6X.~~

**Substantiation:** Testing for an IP rating of IP6X is unnecessary. The thermal imager is sufficiently tested for ingress during the Durability Test described in section 8.13, specifically during the dunk test described in sections 8.13.5.7, 8.13.5.7.2 and 8.13.5.8.3.

**Committee Meeting Action:** **Reject**

**Committee Statement:** It is the intent of the technical committee to test for dust. The IP6X test is testing for a different condition than the dunk test, so both tests need to remain in the standard.

**Number Eligible to Vote:** 21

**Ballot Results:** Affirmative: 16

**Ballot Not Returned:** 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.

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1801-4 Log #CP2 FAE-ELS  
(8.1.5.12)

**Final Action: Accept**

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**Submitter:** Technical Committee on Electronic Safety Equipment,

**Recommendation:** Revise 8.1.5.12 to read as follows:

8.1.5.12 A rectangular region of interest, encompassing at least 90 percent of the source target image area but excluding pixels...". (rest of paragraph to remain as written in 2010 edition).

**Substantiation:** Clarifies the definition of the region of interest.

**Committee Meeting Action:** **Accept**

**Number Eligible to Vote:** 21

**Ballot Results:** Affirmative: 16

**Ballot Not Returned:** 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.

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1801-5 Log #4 FAE-ELS  
(8.1.6.4.1)

Final Action: Accept in Principle

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Submitter: Landon Borders, Bullard

Recommendation: Revise text to read as follows:

~~The spatial resolution source target for~~ One randomly chosen specimen shall be rotated 180 degrees, such that the lower indices appear on the right side of the ~~spatial resolution source target~~ specimen's display. All other components of the equipment setup shall remain unchanged.

Substantiation: It is impractical to rotate the spatial resolution target due to its size and weight. Rotating the thermal imager 180 degrees accomplishes the same intent.

Committee Meeting Action: Accept in Principle

Revise text in 8.1.6.4.1 to read as follows:

8.1.6.4.1 For one randomly chosen specimen either the spatial resolution source target or the specimen shall be rotated 180 degrees, such that the lower indices appear on the right side of the specimen's display. All other components of the equipment setup shall remain unchanged.

Committee Statement: The proposed revised text allows the test lab the option of rotating the specimen or the target.

Number Eligible to Vote: 21

Ballot Results: Affirmative: 16

Ballot Not Returned: 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.

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1801-6 Log #5 FAE-ELS  
(8.1.6.11)

Final Action: Accept

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Submitter: Landon Borders, Bullard

Recommendation: Revise text to read as follows:

The captured images shall be rotated ~~45 degrees~~ such that the centerline of the converging lines of interest is vertical. The contrast transfer function (*CTF*) and the mean pixel intensity ( $\mu$ ) of the two sets of converging lines of the stencil pattern in the captured images shall be calculated at each of the numbered indices, beginning at 1 and ending at 9. ~~A~~ Regions of interest that encloses each of the two sets of converging lines of the stencil pattern shall be used to select pixels for analysis.

Substantiation: The intent is to rotate the converging lines such that the center line is vertical. This is not necessarily accomplished by rotating the image 45 degrees.

There is more than one region of interest, so the last sentence should be pluralized.

Committee Meeting Action: Accept

Number Eligible to Vote: 21

Ballot Results: Affirmative: 16

Ballot Not Returned: 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.

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1801-7 Log #6 FAE-ELS  
(8.1.6.20)

Final Action: Accept in Principle

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Submitter: Landon Borders, Bullard

Recommendation: Revise text to read as follows:

The image quality probability ( $P/Q$ ) shall be calculated for the nonuniformity procedure at setpoint temperatures of 1°C, 30°C, 100°C, 160°C, and 260°C (34°F, 86°F, 212°F, 320°F, and 500°F) as specified in Equation 8.1.6.19, where C is the CTF calculated at index 1 in 8.1.6.12, B is the average brightness mean pixel intensity  $\mu$  calculated in ~~8.1.6.14~~ 8.1.5.14b for NU(1), NU(30), NU(100), NU(160), and NU(260), SR is the spatial resolution calculated in 8.1.6.18, and UN is the nonuniformity value calculated in 8.1.5.16, NU(1), NU(30), NU(100), NU(160), and NU(260).

Substantiation: The image quality probability "B" coefficient calculation was improperly reported in the 1st edition for the uniformity procedure.

Committee Meeting Action: Accept in Principle

Revise text to read as follows:

8.1.6.20 The image quality probability ( $P/Q$ ) shall be calculated for the nonuniformity procedure at setpoint temperatures of 1°C, 30°C, 100°C, 160°C, and 260°C (34°F, 86°F, 212°F, 320°F, and 500°F) as specified in Equation 8.1.6.19, where C is the CTF<sub>1</sub> value calculated in 8.1.6.12, B is the average brightness mean pixel intensity  $\mu$  calculated in ~~8.1.6.14~~ 8.1.5.14b for NU(1), NU(30), NU(100), NU(160), and NU(260), SR is the spatial resolution calculated in 8.1.6.18, and NU is the nonuniformity value calculated in 8.1.5.16 for NU(1), NU(30), NU(100), NU(160), and NU(260), respectively.

Committee Statement: The committee accepted the proposal in principle and revised the text to include language that clarifies the values used for brightness in the PIQ calculation.

Number Eligible to Vote: 21

Ballot Results: Affirmative: 16

Ballot Not Returned: 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.

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1801-8 Log #CP3 FAE-ELS  
(Figure 8.10.4.3)

Final Action: Accept

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Submitter: Technical Committee on Electronic Safety Equipment,

Recommendation: In Figure 8.10.4.3, change the temperature from 30°C to 50°C. Also, move side dotted lines so that they go down the middle of the white bars on either side of the Figure.

Substantiation: To make Figure consistent with text.

Committee Meeting Action: Accept

Number Eligible to Vote: 21

Ballot Results: Affirmative: 16

Ballot Not Returned: 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.

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1801-9 Log #7 FAE-ELS  
(8.10.4.3.1)

**Final Action: Reject**

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**Submitter:** Landon Borders, Bullard

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

The surface labeled *T*<sub>hot</sub> shall range in temperature from ~~ambient~~ 50°C (122°F) to 550°C (1022°F) and shall fill at least 50 percent of the FOV. The radiation source producing the *T*<sub>hot</sub> surface shall be a blackbody and shall have an emissivity of 0.95, ±0.03. The source target shall be calibrated at least every 6 months. The nonuniformity of the blackbody shall not exceed 0.02. The blackbody temperature accuracy shall be ±0.5°C (±1°F). The stability of the emitting surface temperatures shall be 0.15°C. The nonuniformity of the blackbody.

**Substantiation:** Blackbodies that meet the performance criteria detailed in this test are not typically designed for calibration below 50°C. The certified laboratories cannot perform tests using equipment operated outside of its calibrated range.

**Committee Meeting Action:** **Reject**

**Committee Statement:** This is part of a Tentative Interim Amendment going before the NFPA Standards Council in February 2011 which has also been added as a committee proposal.

**Number Eligible to Vote:** 21

**Ballot Results:** Affirmative: 16

**Ballot Not Returned:** 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.

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1801-10 Log #CP4 FAE-ELS  
(8.10.4.3.1)

**Final Action: Accept**

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**Submitter:** Technical Committee on Electronic Safety Equipment,

**Recommendation:** Revise first sentence to read in 8.10.4.3.1 to read as follows:

8.10.4.3.1 "...shall fill at least 50 percent of the area of the FOV." (Remaining paragraph text stays).

**Substantiation:** This proposed change clarifies the region of interest.

**Committee Meeting Action:** **Accept**

**Number Eligible to Vote:** 21

**Ballot Results:** Affirmative: 16

**Ballot Not Returned:** 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.

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1801-11 Log #8 FAE-ELS  
(8.10.5.5)

**Final Action: Accept**

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**Submitter:** Landon Borders, Bullard

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

8.10.5.5 All surface temperatures in the FOV shall be ~~adjusted to~~ set at the assigned temperatures and shall be allowed to come to steady-state prior to starting the test.

**Substantiation:** Add clarification that the blackbodies must be steady state prior to the test and not during the test.

**Committee Meeting Action:** **Accept**

**Number Eligible to Vote:** 21

**Ballot Results:** Affirmative: 16

**Ballot Not Returned:** 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.

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1801-12 Log #CP5 FAE-ELS  
(8.10.6.1, 8.10.7.1)

Final Action: Accept

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Submitter: Technical Committee on Electronic Safety Equipment,

Recommendation: Move 8.10.6.1 to a new paragraph 8.10.5.11.

Delete 8.10.7.1. Renumber existing paragraphs in 8.10.6 and 8.10.7.

Substantiation: Procedure required in 8.10.7.1 is redundant. Test procedure is more applicable under the General Procedure in 8.10.5.

Committee Meeting Action: Accept

Number Eligible to Vote: 21

Ballot Results: Affirmative: 16

Ballot Not Returned: 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.

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1801-13 Log #CP6 FAE-ELS  
(8.10.7.3)

Final Action: Accept

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Submitter: Technical Committee on Electronic Safety Equipment,

Recommendation: Revise first sentence in 8.10.7.3 to read as follows:

8.10.7.3 The bar contrast, *C*, shall be calculated for the bar region of interest of for each image as specified...".

(Remainder of paragraph to remain as written in the 2010 edition).

Substantiation: More specifically define and clarify the region of interest.

Committee Meeting Action: Accept

Number Eligible to Vote: 21

Ballot Results: Affirmative: 16

Ballot Not Returned: 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.

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1801-14 Log #1 FAE-ELS  
(B.1.2.3)

Final Action: Accept

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Submitter: John F. Bender, Underwriters Laboratories Inc.

Recommendation: Revise text to read as follows:

B.1.2.3 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096

UL 1642, Standard for Lithium Batteries, 2005, Revised 2009.

UL 2054, Standard for Household and Commercial Batteries, 2004, Revised 2009.

Substantiation: Update referenced standards to most recent revisions.

Committee Meeting Action: Accept

Number Eligible to Vote: 21

Ballot Results: Affirmative: 16

Ballot Not Returned: 5 Hull, J., Parkulo, C., Roche, K., Spoons, C., Wolf, T.