4.1.2

Prior to certification of wildland fire-fighting respirators to this standard, respirators shall be certified by NIOSH in accordance with 42 CFR 84 as a "wildland fire-fighting air-purifying respirator," or as a "wildland fire-fighting powered air-purifying respirator."

Additional Proposed Changes

<table>
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<tr>
<th>File Name</th>
<th>Description Approved</th>
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</thead>
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<td>Proposed_TIA_1984_Log_1017.docx</td>
<td>Balloted TIA</td>
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</tbody>
</table>

Statement of Problem and Substantiation for Public Input

NFPA 1984, as-written, requires NIOSH certification "as a wildland firefighting air-purifying respirator or as a wildland firefighting powered air-purifying respirator." This NIOSH certification requirement is based on performance requirements and protections specifically developed by the wildland fire fighting task group. The present requirements contained in 42 C.F.R. Part 84 gives NIOSH the authority to approve respirators for protection against the combination of gas and vapor with particulates identified by NFPA for the protection of wildland fire fighters. In order to certify respirators using these existing authorities, test requirements must be added to NFPA 1984.

Emergency Nature: The collective protection approval for a wildland fire fighting respirator standard would require NIOSH to go through their formal rulemaking process. Although initiated approximately 12 months ago, it is anticipated to take at least another two years before a final rule would be completed. Manufacturers will not be able to submit products for approval until the effective date of the final rule. This means that NFPA/NIOSH-compliant wildland respirators will not be available to wildland fire fighters for several years. However, on the effective date of the TIA, manufacturers would be able to submit products to NIOSH for certification.

Submitter Information Verification

Submitter Full Name: TC on FAE-RPE
Organization: TC on Respiratory Protection Equipment
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jun 19 11:11:11 EDT 2013

Committee Statement
Resolution: FR-1-NFPA 1984-2014

Statement: NFPA 1984, as-written, requires NIOSH certification "as a wildland firefighting air-purifying respirator or as a wildland firefighting powered air-purifying respirator." This NIOSH certification requirement is based on performance requirements and protections specifically developed by the wildland firefighting task group. The present requirements contained in 42 C.F.R. Part 84 gives NIOSH the authority to approve respirators for protection against the combination of gas and vapor with particulates identified by NFPA for the protection of wildland fire fighters. In order to certify respirators using these existing authorities, test requirements must be added to NFPA 1984.

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NFPA 1984-2011
Standard on Respirators for Wildland Fire Fighting Operations
TIA Log No. 1017
Reference: 4.1.2, A.4.1.2, 6.1.2, 7.1.8, 7.2, 7.3, and Chapter 8
Comment Closing Date: January 21, 2011
Submitter: Heinz W. Ahlers, National Institute for Occupational Safety & Health

1. Revise 4.1.2 and A.4.1.2 to read as follows:

4.1.2* Prior to certification of wildland fire fighting respirators to this standard, respirators shall be certified by NIOSH as an "wildland fire fighting air-purifying respirator" or as a "wildland fire fighting powered air-purifying respirator."

A.4.1.2 Respirators certified by NIOSH in accordance with 42 CFR Part 84 as a wildland fire fighting air-purifying respirator (APR), or as a wildland fire fighting powered air-purifying respirator (PAPR) will be approved under a collective protection approval. In addition to the breathing resistance and gas and vapor performance requirements specified in 7.1.8 through 7.3, NIOSH testing includes the following:

NIOSH testing includes the following:

Breathing resistance (APR and Tight-Fitting PAPR only): Inhalation and exhalation resistance at 150 lpm constant flow with a maximum inhalation resistance of 80 mm water column and a maximum exhalation resistance of 25 mm water column, with the PAPR blower turned off during testing. Note: NIOSH does not test breathing resistance on loose-fitting PAPRs.

Facepiece Carbon Dioxide Concentration: Verification that the respiratory inlet covering carbon dioxide concentration does not exceed 1.0 percent.

Gas and vapor testing: Protection against the following gases and vapors: Carbon monoxide, Organic vapors, Formaldehyde, Acrolein, Sulfur Dioxide, Nitrogen Dioxide

Particulate filter efficiency: Minimum NIOSH-certified R95 particulate filter efficiency level. A filter medium that removes at least 95 percent of an aerosol of dioctylphthalate (DOP) having a mass median aerodynamic diameter of 0.3 μm, at a maximum challenge loading of 200 mg are R95 filters.

Powered air purifying respirator power supply life: Verification that the power source provides at least 8 hours of continuous use without recharging or replacement.

2. Revise 6.1.2 to read as follows:

6.1.2 Prior to certification of wildland fire fighting respirators to the requirements of this standard, all respirators shall first be certified by NIOSH as either a wildland fire fighting APR, or as a wildland firefighting PAPR in accordance with 42 CFR 84.

3. Add the following to Chapter 7:

7.1.8 All wildland fire fighting respirators with a tight-fitting facepiece shall be tested for breathing resistance as specified in Section 8.8, Breathing Resistance Test. The inhalation resistance shall not exceed 80 mm water column and the exhalation resistance shall not exceed 25 mm water column when tested at 150 lpm.

7.2 Air-purifying respirator (APR) air purification components shall be tested for gas and vapor capacity as specified in the applicable test methods in Section 8.9, Air Purifying Respirator (APR) Air Purification Component Capacity Test, and the breakthrough concentration for each test representative agent shall not exceed the applicable values specified in Table 8.9.4a and Table 8.9.4b.

7.3 Powered air-purifying respirator (PAPR) air purification components shall be tested for gas and vapor capacity as specified in the applicable test methods in Section 8.10, Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test, and the breakthrough concentration for each test representative agent shall not exceed the applicable values specified in Table 8.10.4.

4. Add the following to Chapter 8:
8.8 **Breathing Resistance Test.**

8.8.1 **Application.** This test method shall apply to all wildland fire fighting respirators with a tight-fitting facepiece.

8.8.2 **Samples.**

8.8.2.1 Samples shall be complete wildland fire fighting respirators.

8.8.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.8.3 **Specimens.**

8.8.3.1 Specimens shall be complete respirators.

8.8.3.2 At least three specimens shall be tested.

8.8.4 **Procedure.**

8.8.4.1 Testing shall be performed as specified in the applicable NIOSH test procedure.

8.8.4.2 PAPRs shall be tested with the blower turned off.

8.8.5 **Report.** Inhalation and exhalation resistance shall be recorded and reported for each test specimen.

8.8.6 **Interpretation.**

8.8.6.1 Inhalation and exhalation resistance shall be used to determine pass or fail performance.

8.8.6.2 One or more specimens failing this test shall constitute failing performance.

8.9 **Air Purifying Respirator (APR) Air Purification Component Capacity Test.**

8.9.1 **Application.** This test method shall apply to all non-powered wildland fire fighting respirators.

8.9.2 **Samples.**

8.9.2.1 Samples shall be air purifying components of wildland fire fighting respirators, or complete disposable wildland fire fighting respirators.

8.9.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.9.3 **Specimens.**

8.9.3.1 Specimens shall be the air purification component or components of wildland fire fighting respirators, or complete disposable respirators.

8.9.3.2 At least three specimens of each air purification component shall be tested.

8.9.4 **Procedure.** Testing shall be performed as specified in the applicable NIOSH test procedure.

8.9.5 **Report.** Breakthrough concentration shall be recorded and reported for each test specimen.

8.9.6 **Interpretation.**

8.9.6.1 Breakthrough concentration shall be used to determine pass or fail performance.
8.9.6.2 One or more specimens failing this test shall constitute failing performance.

8.10 Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test.

8.10.1 Application. This test method shall apply to all powered wildland fire fighting respirators.

8.10.2 Samples.

8.10.2.1 Samples shall be air purifying components of wildland fire fighting respirators.

8.10.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.10.3 Specimens.

8.10.3.1 Specimens shall be the air purification component or components of wildland fire fighting respirators.

8.10.3.2 At least three specimens of each air purification component shall be tested.

8.10.4 Procedure. Testing shall be performed as specified in the applicable NIOSH test procedure.

8.10.5 Report. Breakthrough concentration shall be recorded and reported for each test specimen.

8.10.6 Interpretation.

8.10.6.1 Breakthrough concentration shall be used to determine pass or fail performance.

8.10.6.2 One or more specimens failing this test shall constitute failing performance.

### Table 8.9.4a Air Purifying Respirator (APR) Air Purification Component Capacity Test Requirements

<table>
<thead>
<tr>
<th>Protection</th>
<th>Test Temp. (°C)</th>
<th>Test RH</th>
<th>Gas/vapor</th>
<th>Challenge Concentration (ppm)</th>
<th>Flow rate</th>
<th>Penetration (ppm)</th>
<th>Minimum Service Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>64</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide Intermittent use</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>64</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>240, storage for 20 hours, 240</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>64</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 768 mL cumulative</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide Inspiration Temperature</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>40 cyclic at 24 rpm</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 60 mL cumulative³</td>
<td>60</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>80%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>64</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>25%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>64</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>80%</td>
<td>SO₂</td>
<td>50</td>
<td>64</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>25%</td>
<td>SO₂</td>
<td>50</td>
<td>64</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>80%</td>
<td>NO₂</td>
<td>25</td>
<td>64</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>30</td>
</tr>
</tbody>
</table>
1Constant flow unless otherwise specified
2The inspired air temperature, measured at the facepiece, shall be less than or equal to 50°C (wet bulb) if the relative humidity is equal or greater than 50%. The inspired air temperature shall be less than or equal to 55°C (dry bulb) if the inspired air relative humidity is less than 50%.

Table 8.9.4b Air Purifying Respirator (APR) Air Purification Component Residence Test Requirements

<table>
<thead>
<tr>
<th>Protection</th>
<th>Test Temp. (°C)</th>
<th>Test RH</th>
<th>Gas/ Vapor</th>
<th>Challenge Concentration (ppm)</th>
<th>Flow rate (lpm)</th>
<th>Penetration (ppm)</th>
<th>Minimum Service Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>80%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>110</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>25%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>110</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>80%</td>
<td>SO₂</td>
<td>50</td>
<td>110</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>25%</td>
<td>SO₂</td>
<td>50</td>
<td>110</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>80%</td>
<td>NO₂</td>
<td>25</td>
<td>110</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>5</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>25%</td>
<td>NO₂</td>
<td>25</td>
<td>110</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>5</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>80%</td>
<td>HCHO</td>
<td>50</td>
<td>110</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>25%</td>
<td>HCHO</td>
<td>50</td>
<td>110</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Acrolein</td>
<td>25</td>
<td>80%</td>
<td>C₃H₄O</td>
<td>10</td>
<td>110</td>
<td>0.1</td>
<td>5</td>
</tr>
<tr>
<td>Acrolein</td>
<td>25</td>
<td>25%</td>
<td>C₃H₄O</td>
<td>10</td>
<td>110</td>
<td>0.1</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 8.10.4 Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test Requirements

<table>
<thead>
<tr>
<th>Protection</th>
<th>Test Temp. (°C)</th>
<th>Test RH</th>
<th>Gas/ vapor</th>
<th>Challenge Concentration (ppm)</th>
<th>Flow rate¹ (lpm)</th>
<th>Penetration (ppm)</th>
<th>Minimum Service Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>115 / 170</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>115 / 170</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>240, storage for 20 hours, 240</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>115 / 170</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 1380 / 2040 mL cumulative</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>115 / 170</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 60 mL cumulative²</td>
<td>60</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>80%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>115 / 170</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Gas</td>
<td>ADR</td>
<td>MGR</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>25%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>115 / 170</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>80%</td>
<td>SO₂</td>
<td>50</td>
<td>115 / 170</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>25%</td>
<td>SO₂</td>
<td>50</td>
<td>115 / 170</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>80%</td>
<td>NO₂</td>
<td>25</td>
<td>115 / 170</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>30</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>25%</td>
<td>NO₂</td>
<td>25</td>
<td>115 / 170</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>30</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>80%</td>
<td>HCHO</td>
<td>50</td>
<td>115 / 170</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>25%</td>
<td>HCHO</td>
<td>50</td>
<td>115 / 170</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Acrolein</td>
<td>25</td>
<td>80%</td>
<td>C₃H₄O</td>
<td>10</td>
<td>115 / 170</td>
<td>0.1</td>
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<tr>
<td>Acrolein</td>
<td>25</td>
<td>25%</td>
<td>C₃H₄O</td>
<td>10</td>
<td>115 / 170</td>
<td>0.1</td>
<td>20</td>
</tr>
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²The inspired air temperature, measured at the facepiece, shall be less than or equal to 50°C (wet bulb) if the relative humidity is equal or greater than 50%. The inspired air temperature shall be less than or equal to 55°C (dry bulb) if the inspired air relative humidity is less than 50%.

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Public Input No. 3-NFPA 1984-2013 [ Section No. 6.1.2 ]

Note: This Proposal originates from Tentative Interim Amendment 1984-11-1
(TIA 1017) issued by the Standards Council on March 1, 2011.

6.1.2

Prior to certification of wildland fire-fighting respirators to the
requirements of this standard, all respirators shall first be
certified by NIOSH as either a wildland fire-fighting APR or as a
wildland fire-fighting PAPR, in accordance with 42 CFR 84.

Additional Proposed Changes

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Submitter Information Verification

Submitter Full Name: TC on FAE-RPE
Organization: TC on Respiratory Protection Equipment
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jun 19 11:17:11 EDT 2013

Committee Statement
**Resolution:** FR-3-NFPA 1984-2014  
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4.1.2* Prior to certification of wildland fire fighting respirators to this standard, respirators shall be certified by NIOSH as an "wildland fire fighting air-purifying respirator" or as a "wildland fire fighting powered air-purifying respirator."

A.4.1.2 Respirators certified by NIOSH in accordance with 42 CFR Part 84 as a wildland fire fighting air-purifying respirator (APR), or as a wildland fire fighting powered air-purifying respirator (PAPR) will be approved under a collective protection approval. In addition to the breathing resistance and gas and vapor performance requirements specified in 7.1.8 through 7.3, NIOSH testing includes the following:

NIOSH testing includes the following:

**Breathing resistance (APR and Tight-Fitting PAPR only):** Inhalation and exhalation resistance at 150 lpm constant flow with a maximum inhalation resistance of 80 mm water column and a maximum exhalation resistance of 25 mm water column, with the PAPR blower turned off during testing. Note: NIOSH does not test breathing resistance on loose-fitting PAPRs.

**Facepiece Carbon Dioxide Concentration:** Verification that the respiratory inlet covering carbon dioxide concentration does not exceed 1.0 percent.

**Gas and vapor testing:** Protection against the following gases and vapors: Carbon monoxide, Organic vapors, Formaldehyde, Acrolein, Sulfur Dioxide, Nitrogen Dioxide

**Particulate filter efficiency:** Minimum NIOSH-certified R95 particulate filter efficiency level. A filter medium that removes at least 95 percent of an aerosol of dioctylphthalate (DOP) having a mass median aerodynamic diameter of 0.3 μm, at a maximum challenge loading of 200 mg are R95 filters.

**Powered air purifying respirator power supply life:** Verification that the power source provides at least 8 hours of continuous use without recharging or replacement.

2. Revise 6.1.2 to read as follows:

6.1.2 Prior to certification of wildland fire fighting respirators to the requirements of this standard, all respirators shall first be certified by NIOSH as either a wildland fire fighting APR, or as a wildland firefighting PAPR in accordance with 42 CFR 84.

3. Add the following to Chapter 7:

7.1.8 All wildland fire fighting respirators with a tight-fitting facepiece shall be tested for breathing resistance as specified in Section 8.8, Breathing Resistance Test. The inhalation resistance shall not exceed 80 mm water column and the exhalation resistance shall not exceed 25 mm water column when tested at 150 lpm.

7.2 Air-purifying respirator (APR) air purification components shall be tested for gas and vapor capacity as specified in the applicable test methods in Section 8.9, Air Purifying Respirator (APR) Air Purification Component Capacity Test, and the breakthrough concentration for each test representative agent shall not exceed the applicable values specified in Table 8.9.4a and Table 8.9.4b.

7.3 Powered air-purifying respirator (PAPR) air purification components shall be tested for gas and vapor capacity as specified in the applicable test methods in Section 8.10, Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test, and the breakthrough concentration for each test representative agent shall not exceed the applicable values specified in Table 8.10.4.

4. Add the following to Chapter 8:
8.8 Breathing Resistance Test.

8.8.1 Application. This test method shall apply to all wildland fire fighting respirators with a tight-fitting facepiece.

8.8.2 Samples.

8.8.2.1 Samples shall be complete wildland fire fighting respirators.

8.8.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.8.3 Specimens.

8.8.3.1 Specimens shall be complete respirators.

8.8.3.2 At least three specimens shall be tested.

8.8.4 Procedure.

8.8.4.1 Testing shall be performed as specified in the applicable NIOSH test procedure.

8.8.4.2 PAPRs shall be tested with the blower turned off.

8.8.5 Report. Inhalation and exhalation resistance shall be recorded and reported for each test specimen.

8.8.6 Interpretation.

8.8.6.1 Inhalation and exhalation resistance shall be used to determine pass or fail performance.

8.8.6.2 One or more specimens failing this test shall constitute failing performance.

8.9 Air Purifying Respirator (APR) Air Purification Component Capacity Test.

8.9.1 Application. This test method shall apply to all non-powered wildland fire fighting respirators.

8.9.2 Samples.

8.9.2.1 Samples shall be air purifying components of wildland fire fighting respirators, or complete disposable wildland fire fighting respirators.

8.9.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.9.3 Specimens.

8.9.3.1 Specimens shall be the air purification component or components of wildland fire fighting respirators, or complete disposable respirators.

8.9.3.2 At least three specimens of each air purification component shall be tested.

8.9.4 Procedure. Testing shall be performed as specified in the applicable NIOSH test procedure.

8.9.5 Report. Breakthrough concentration shall be recorded and reported for each test specimen.

8.9.6 Interpretation.

8.9.6.1 Breakthrough concentration shall be used to determine pass or fail performance.
8.9.6.2 One or more specimens failing this test shall constitute failing performance.

8.10 Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test.

8.10.1 Application. This test method shall apply to all powered wildland fire fighting respirators.

8.10.2 Samples.

8.10.2.1 Samples shall be air purifying components of wildland fire fighting respirators.

8.10.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.10.3 Specimens.

8.10.3.1 Specimens shall be the air purification component or components of wildland fire fighting respirators.

8.10.3.2 At least three specimens of each air purification component shall be tested.

8.10.4 Procedure. Testing shall be performed as specified in the applicable NIOSH test procedure.

8.10.5 Report. Breakthrough concentration shall be recorded and reported for each test specimen.

8.10.6 Interpretation.

8.10.6.1 Breakthrough concentration shall be used to determine pass or fail performance.

8.10.6.2 One or more specimens failing this test shall constitute failing performance.

### Table 8.9.4a Air Purifying Respirator (APR) Air Purification Component Capacity Test Requirements

<table>
<thead>
<tr>
<th>Protection</th>
<th>Test Temp. (°C)</th>
<th>Test RH</th>
<th>Gas/vapor</th>
<th>Challenge Concentration (ppm)</th>
<th>Flow rate (lpm)</th>
<th>Penetration (ppm)</th>
<th>Minimum Service Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>64</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>64</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>240, storage for 20 hours, 240</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>64</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 768 mL cumulative</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>40 cyclic at 24 rpm</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 60 mL cumulative</td>
<td>60</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>80%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>64</td>
<td>10 ppm NO₂ or 25 ppm NO</td>
<td>20</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>25%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>64</td>
<td>10 ppm NO₂ or 25 ppm NO</td>
<td>20</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>80%</td>
<td>SO₂</td>
<td>50</td>
<td>64</td>
<td>5 ppm NO₂ or 25 ppm NO</td>
<td>30</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>25%</td>
<td>SO₂</td>
<td>50</td>
<td>64</td>
<td>5 ppm NO₂ or 25 ppm NO</td>
<td>30</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>80%</td>
<td>NO₂</td>
<td>25</td>
<td>64</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>30</td>
</tr>
</tbody>
</table>
Nitrogen dioxide | 25 | 25% | NO₂ | 25 | 64 | 1 ppm NO₂ or 25 ppm NO | 30
Formaldehyde | 25 | 80% | HCHO | 50 | 64 | 1 | 30
Formaldehyde | 25 | 25% | HCHO | 50 | 64 | 1 | 30
Acrolein | 25 | 80% | C₃H₄O | 10 | 64 | 0.1 | 20
Acrolein | 25 | 25% | C₃H₄O | 10 | 64 | 0.1 | 20

¹Constant flow unless otherwise specified
²The inspired air temperature, measured at the facepiece, shall be less than or equal to 50°C (wet bulb) if the relative humidity is equal or greater than 50%. The inspired air temperature shall be less than or equal to 55°C (dry bulb) if the inspired air relative humidity is less than 50%.

Table 8.9.4b Air Purifying Respirator (APR) Air Purification Component Residence Test Requirements

| Protection | Test Temp. (°C) | Test RH | Gas/ Vapor | Challenge Concentration (ppm) | Flow rate (lpm) | Penetration (ppm) | Minimum Service Time (minutes) |
|------------|----------------|---------|------------|-------------------------------|----------------|------------------|================================|
| Organic vapors | 25 | 80% | C₆H₁₂ | 300 | 110 | 10 | 5 |
| Organic vapors | 25 | 25% | C₆H₁₂ | 300 | 110 | 10 | 5 |
| Sulfur dioxide | 25 | 80% | SO₂ | 50 | 110 | 5 | 5 |
| Sulfur dioxide | 25 | 25% | SO₂ | 50 | 110 | 5 | 5 |
| Nitrogen dioxide | 25 | 80% | NO₂ | 25 | 110 | 1 ppm NO₂ or 25 ppm NO | 5 |
| Nitrogen dioxide | 25 | 25% | NO₂ | 25 | 110 | 1 ppm NO₂ or 25 ppm NO | 5 |
| Formaldehyde | 25 | 80% | HCHO | 50 | 110 | 1 | 5 |
| Formaldehyde | 25 | 25% | HCHO | 50 | 110 | 1 | 5 |
| Acrolein | 25 | 80% | C₃H₄O | 10 | 110 | 0.1 | 5 |
| Acrolein | 25 | 25% | C₃H₄O | 10 | 110 | 0.1 | 5 |

Table 8.10.4 Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test Requirements

<p>| Protection | Test Temp. (°C) | Test RH | Gas/ vapor | Challenge Concentration (ppm) | Flow rate¹ (lpm) | Penetration (ppm) | Minimum Service Time (minutes) |
|------------|----------------|---------|------------|-------------------------------|----------------|------------------|================================|
| Carbon monoxide | 25 | 92% | CO | 200 | 115 / 170 | 25 ppm averaged over a rolling 5 min time frame | 480 |
| Carbon monoxide Intermittent use | 25 | 92% | CO | 200 | 115 / 170 | 25 ppm averaged over a rolling 5 min time frame | 240, storage for 20 hours, 240 |
| Carbon monoxide | 25 | 92% | CO | 1200 | 115 / 170 | 200 ppm averaged over a rolling 5 min time frame &amp; 1380 / 2040 mL cumulative | 480 |
| Carbon monoxide Inspiration Temperature | 25 | 92% | CO | 1200 | 115 / 170 | 200 ppm averaged over a rolling 5 min time frame &amp; 60 mL cumulative² | 60 |
| Organic vapors | 25 | 80% | C₆H₁₂ | 300 | 115 / 170 | 10 | 20 |</p>
<table>
<thead>
<tr>
<th>Compound</th>
<th>Mass Flow</th>
<th>Concentration</th>
<th>Compound</th>
<th>Mass Flow</th>
<th>Concentration</th>
<th>Temp</th>
<th>Wet Bulb</th>
<th>Dry Bulb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>25%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>115 / 170</td>
<td>10</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>80%</td>
<td>SO₂</td>
<td>50</td>
<td>115 / 170</td>
<td>5</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>25%</td>
<td>SO₂</td>
<td>50</td>
<td>115 / 170</td>
<td>5</td>
<td>30</td>
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<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>80%</td>
<td>NO₂</td>
<td>25</td>
<td>115 / 170</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>25%</td>
<td>NO₂</td>
<td>25</td>
<td>115 / 170</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>80%</td>
<td>HCHO</td>
<td>50</td>
<td>115 / 170</td>
<td>1</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>25%</td>
<td>HCHO</td>
<td>50</td>
<td>115 / 170</td>
<td>1</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Acrolein</td>
<td>25</td>
<td>80%</td>
<td>C₃H₄O</td>
<td>10</td>
<td>115 / 170</td>
<td>0.1</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Acrolein</td>
<td>25</td>
<td>25%</td>
<td>C₃H₄O</td>
<td>10</td>
<td>115 / 170</td>
<td>0.1</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

1Constant flow unless otherwise specified
2The inspired air temperature, measured at the facepiece, shall be less than or equal to 50°C (wet bulb) if the relative humidity is equal or greater than 50%. The inspired air temperature shall be less than or equal to 55°C (dry bulb) if the inspired air relative humidity is less than 50%.

**Submitter’s Substantiation:** NFPA 1984, as-written, requires NIOSH certification “as a wildland firefighting air-purifying respirator or as a wildland firefighting powered air-purifying respirator.” This NIOSH certification requirement is based on performance requirements and protections specifically developed by the wildland fire fighting task group. The present requirements contained in 42 C.F.R. Part 84 gives NIOSH the authority to approve respirators for protection against the combination of gas and vapor with particulates identified by NFPA for the protection of wildland fire fighters. In order to certify respirators using these existing authorities, test requirements must be added to NFPA 1984.

**Emergency Nature:** The collective protection approval for a wildland fire fighting respirator standard would require NIOSH to go through their formal rulemaking process. Although initiated approximately 12 months ago, it is anticipated to take at least another two years before a final rule would be completed. Manufacturers will not be able to submit products for approval until the effective date of the final rule. This means that NFPA/NIOSH-compliant wildland respirators will not be available to wildland fire fighters for several years. However, on the effective date of the TIA, manufacturers would be able to submit products to NIOSH for certification.
Public Input No. 4-NFPA 1984-2013 [ New Section after 7.1.7 ]

Note: This Proposal originates from Tentative Interim Amendment 1984-11-1 (TIA 1017) issued by the Standards Council on March 1, 2011.

7.1.8 All wildland fire fighting respirators with a tight-fitting facepiece shall be tested for breathing resistance as specified in Section 8.8, Breathing Resistance Test. The inhalation resistance shall not exceed 80 mm water column and the exhalation resistance shall not exceed 25 mm water column when tested at 150 lpm.

7.2 Air-purifying respirator (APR) air purification components shall be tested for gas and vapor capacity as specified in the applicable test methods in Section 8.9, Air Purifying Respirator (APR) Air Purification Component Capacity Test, and the breakthrough concentration for each test representative agent shall not exceed the applicable values specified in Table 8.9.4a and Table 8.9.4b.

7.3 Powered air-purifying respirator (PAPR) air purification components shall be tested for gas and vapor capacity as specified in the applicable test methods in Section 8.10, Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test, and the breakthrough concentration for each test representative agent shall not exceed the applicable values specified in Table 8.10.4.

Additional Proposed Changes

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<thead>
<tr>
<th>File Name</th>
<th>Description Approved</th>
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</thead>
<tbody>
<tr>
<td>Proposed_TIA_1984_Log_1017.docx</td>
<td>Balloted TIA</td>
</tr>
</tbody>
</table>

Statement of Problem and Substantiation for Public Input

NFPA 1984, as-written, requires NIOSH certification “as a wildland firefighting air-purifying respirator or as a wildland firefighting powered air-purifying respirator.” This NIOSH certification requirement is based on performance requirements and protections specifically developed by the wildland fire fighting task group. The present requirements contained in 42 C.F.R. Part 84 gives NIOSH the authority to approve respirators for protection against the combination of gas and vapor with particulates identified by NFPA for the protection of wildland fire fighters. In order to certify respirators using these existing authorities, test requirements must be added to NFPA 1984.

Emergency Nature: The collective protection approval for a wildland fire fighting respirator standard would require NIOSH to go through their formal rulemaking process. Although initiated approximately 12 months ago, it is anticipated to take at least another two years before a final rule would be completed. Manufacturers will not be able to submit products for approval until the effective date of the final rule. This means that NFPA/NIOSH-compliant wildland respirators will not be available to wildland fire fighters for several years. However, on the effective date of the TIA, manufacturers would be able to submit products to NIOSH for certification.

Submitter Information Verification
Committee Statement

Resolution: FR-4-NFPA 1984-2014
Statement: NFPA 1984, as-written, requires NIOSH certification “as a wildland firefighting air-purifying respirator or as a wildland firefighting powered air-purifying respirator.” This NIOSH certification requirement is based on performance requirements and protections specifically developed by the wildland firefighting task group. The present requirements contained in 42 C.F.R. Part 84 gives NIOSH the authority to approve respirators for protection against the combination of gas and vapor with particulates identified by NFPA for the protection of wildland fire fighters. In order to certify respirators using these existing authorities, test requirements must be added to NFPA 1984.

Emergency Nature: The collective protection approval for a wildland firefighting respirator standard would require NIOSH to go through their formal rulemaking process. Although initiated approximately 12 months ago, it is anticipated to take at least another two years before a final rule would be completed. Manufacturers will not be able to submit products for approval until the effective date of the final rule. This means that NFPA/NIOSH-compliant wildland respirators will not be available to wildland fire fighters for several years. However, on the effective date of the TIA, manufacturers would be able to submit products to NIOSH for certification.
NFPA 1984-2011
Standard on Respirators for Wildland Fire Fighting Operations
TIA Log No. 1017
Reference: 4.1.2, A.4.1.2, 6.1.2, 7.1.8, 7.2, 7.3, and Chapter 8
Comment Closing Date: January 21, 2011
Submitter: Heinz W. Ahlers, National Institute for Occupational Safety & Health

1. Revise 4.1.2 and A.4.1.2 to read as follows:

4.1.2* Prior to certification of wildland fire fighting respirators to this standard, respirators shall be certified by NIOSH as an a “wildland fire fighting air-purifying respirator” or as a “wildland fire fighting powered air-purifying respirator.”

A.4.1.2 Respirators certified by NIOSH in accordance with 42 CFR Part 84 as a wildland fire fighting air-purifying respirator (APR), or as a wildland fire fighting powered air-purifying respirator (PAPR) will be approved under a collective protection approval. In addition to the breathing resistance and gas and vapor performance requirements specified in 7.1.8 through 7.3, NIOSH testing includes the following:

NIOSH testing includes the following:

**Breathing resistance (APR and Tight-Fitting PAPR only):** Inhalation and exhalation resistance at 150 lpm constant flow with a maximum inhalation resistance of 80 mm water column and a maximum exhalation resistance of 25 mm water column, with the PAPR blower turned off during testing. Note: NIOSH does not test breathing resistance on loose-fitting PAPRs.

**Facepiece Carbon Dioxide Concentration:** Verification that the respiratory inlet covering carbon dioxide concentration does not exceed 1.0 percent.

**Gas and vapor testing:** Protection against the following gases and vapors: Carbon monoxide, Organic vapors, Formaldehyde, Acrolein, Sulfur Dioxide, Nitrogen Dioxide

**Particulate filter efficiency:** Minimum NIOSH-certified R95 particulate filter efficiency level. A filter medium that removes at least 95 percent of an aerosol of dioctylphthalate (DOP) having a mass median aerodynamic diameter of 0.3 μm, at a maximum challenge loading of 200 mg are R95 filters.

**Powered air purifying respirator power supply life:** Verification that the power source provides at least 8 hours of continuous use without recharging or replacement.

2. Revise 6.1.2 to read as follows:

6.1.2 Prior to certification of wildland fire fighting respirators to the requirements of this standard, all respirators shall first be certified by NIOSH as either a wildland fire fighting APR, or as a wildland firefighting PAPR in accordance with 42 CFR 84.

3. Add the following to Chapter 7:

7.1.8 All wildland fire fighting respirators with a tight-fitting facepiece shall be tested for breathing resistance as specified in Section 8.8, Breathing Resistance Test. The inhalation resistance shall not exceed 80 mm water column and the exhalation resistance shall not exceed 25 mm water column when tested at 150 lpm.

7.2 Air-purifying respirator (APR) air purification components shall be tested for gas and vapor capacity as specified in the applicable test methods in Section 8.9, Air Purifying Respirator (APR) Air Purification Component Capacity Test, and the breakthrough concentration for each test representative agent shall not exceed the applicable values specified in Table 8.9.4a and Table 8.9.4b.

7.3 Powered air-purifying respirator (PAPR) air purification components shall be tested for gas and vapor capacity as specified in the applicable test methods in Section 8.10, Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test, and the breakthrough concentration for each test representative agent shall not exceed the applicable values specified in Table 8.10.4.

4. Add the following to Chapter 8:
8.8 Breathing Resistance Test.

8.8.1 Application. This test method shall apply to all wildland fire fighting respirators with a tight-fitting facepiece.

8.8.2 Samples.

8.8.2.1 Samples shall be complete wildland fire fighting respirators.

8.8.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.8.3 Specimens.

8.8.3.1 Specimens shall be complete respirators.

8.8.3.2 At least three specimens shall be tested.

8.8.4 Procedure.

8.8.4.1 Testing shall be performed as specified in the applicable NIOSH test procedure.

8.8.4.2 PAPRs shall be tested with the blower turned off.

8.8.5 Report. Inhalation and exhalation resistance shall be recorded and reported for each test specimen.

8.8.6 Interpretation.

8.8.6.1 Inhalation and exhalation resistance shall be used to determine pass or fail performance.

8.8.6.2 One or more specimens failing this test shall constitute failing performance.

8.9 Air Purifying Respirator (APR) Air Purification Component Capacity Test.

8.9.1 Application. This test method shall apply to all non-powered wildland fire fighting respirators.

8.9.2 Samples.

8.9.2.1 Samples shall be air purifying components of wildland fire fighting respirators, or complete disposable wildland fire fighting respirators.

8.9.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.9.3 Specimens.

8.9.3.1 Specimens shall be the air purification component or components of wildland fire fighting respirators, or complete disposable respirators.

8.9.3.2 At least three specimens of each air purification component shall be tested.

8.9.4 Procedure. Testing shall be performed as specified in the applicable NIOSH test procedure.

8.9.5 Report. Breakthrough concentration shall be recorded and reported for each test specimen.

8.9.6 Interpretation.

8.9.6.1 Breakthrough concentration shall be used to determine pass or fail performance.
8.9.6.2 One or more specimens failing this test shall constitute failing performance.

8.10 Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test.

8.10.1 Application. This test method shall apply to all powered wildland fire fighting respirators.

8.10.2 Samples.

8.10.2.1 Samples shall be air purifying components of wildland fire fighting respirators.

8.10.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.10.3 Specimens.

8.10.3.1 Specimens shall be the air purification component or components of wildland fire fighting respirators.

8.10.3.2 At least three specimens of each air purification component shall be tested.

8.10.4 Procedure. Testing shall be performed as specified in the applicable NIOSH test procedure.

8.10.5 Report. Breakthrough concentration shall be recorded and reported for each test specimen.

8.10.6 Interpretation.

8.10.6.1 Breakthrough concentration shall be used to determine pass or fail performance.

8.10.6.2 One or more specimens failing this test shall constitute failing performance.

### Table 8.9.4a Air Purifying Respirator (APR) Air Purification Component Capacity Test Requirements

<table>
<thead>
<tr>
<th>Protection</th>
<th>Test Temp. (°C)</th>
<th>Test RH</th>
<th>Gas/ vapor</th>
<th>Challenge Concentration (ppm)</th>
<th>Flow rate¹ (lpm)</th>
<th>Penetration (ppm)</th>
<th>Minimum Service Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>64</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>64</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>240, storage for 20 hours, 240</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>64</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 768 mL cumulative</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>40 cyclic at 24 rpm</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 60 mL cumulative²</td>
<td>60</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>80%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>64</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>25%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>64</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>80%</td>
<td>SO₂</td>
<td>50</td>
<td>64</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>25%</td>
<td>SO₂</td>
<td>50</td>
<td>64</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>80%</td>
<td>NO₂</td>
<td>25</td>
<td>64</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>30</td>
</tr>
</tbody>
</table>
Nitrogen dioxide 25 25% NO₂ 25 64 1 ppm NO₂ or 25 ppm NO 30
Formaldehyde 25 80% HCHO 50 64 1 30
Formaldehyde 25 25% HCHO 50 64 1 30
Acrolein 25 80% C₃H₄O 10 64 0.1 20
Acrolein 25 25% C₃H₄O 10 64 0.1 20

¹Constant flow unless otherwise specified
²The inspired air temperature, measured at the facepiece, shall be less than or equal to 50°C (wet bulb) if the relative humidity is equal or greater than 50%. The inspired air temperature shall be less than or equal to 55°C (dry bulb) if the inspired air relative humidity is less than 50%.

Table 8.9.4b Air Purifying Respirator (APR) Air Purification Component Residence Test Requirements

<table>
<thead>
<tr>
<th>Protection</th>
<th>Test Temp. (°C)</th>
<th>Test RH</th>
<th>Gas/Vapor</th>
<th>Challenge Concentration (ppm)</th>
<th>Flow rate (lpm)</th>
<th>Penetration (ppm)</th>
<th>Minimum Service Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>80%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>110</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>25%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>110</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>80%</td>
<td>SO₂</td>
<td>50</td>
<td>110</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>25%</td>
<td>SO₂</td>
<td>50</td>
<td>110</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>80%</td>
<td>NO₂</td>
<td>25</td>
<td>110</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>5</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>25%</td>
<td>NO₂</td>
<td>25</td>
<td>110</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>5</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>80%</td>
<td>HCHO</td>
<td>50</td>
<td>110</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>25%</td>
<td>HCHO</td>
<td>50</td>
<td>110</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Acrolein</td>
<td>25</td>
<td>80%</td>
<td>C₃H₄O</td>
<td>10</td>
<td>110</td>
<td>0.1</td>
<td>5</td>
</tr>
<tr>
<td>Acrolein</td>
<td>25</td>
<td>25%</td>
<td>C₃H₄O</td>
<td>10</td>
<td>110</td>
<td>0.1</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 8.10.4 Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test Requirements

<table>
<thead>
<tr>
<th>Protection</th>
<th>Test Temp. (°C)</th>
<th>Test RH</th>
<th>Gas/Vapor</th>
<th>Challenge Concentration (ppm)</th>
<th>Flow rate¹ (lpm)</th>
<th>Penetration (ppm)</th>
<th>Minimum Service Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>115 / 170</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>115 / 170</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>240, storage for 20 hours, 240</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>115 / 170</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 1380 / 2040 mL cumulative</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>40 cyclic at 24 rpm</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 60 mL cumulative²</td>
<td>60</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>80%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>115 / 170</td>
<td>10</td>
<td>20</td>
</tr>
</tbody>
</table>
Organic vapors  | 25 | 25% | C_6H_{12} | 300 | 115 / 170 | 10 | 20
Sulfur dioxide | 25 | 80% | SO_{2} | 50 | 115 / 170 | 5 | 30
Sulfur dioxide | 25 | 25% | SO_{2} | 50 | 115 / 170 | 5 | 30
Nitrogen dioxide | 25 | 80% | NO_{2} | 25 | 115 / 170 | 1 ppm NO_{2} or 25 ppm NO | 30
Nitrogen dioxide | 25 | 25% | NO_{2} | 25 | 115 / 170 | 1 ppm NO_{2} or 25 ppm NO | 30
Formaldehyde | 25 | 80% | HCHO | 50 | 115 / 170 | 1 | 30
Formaldehyde | 25 | 25% | HCHO | 50 | 115 / 170 | 1 | 30
Acrolein | 25 | 80% | C_{3}H_{4}O | 10 | 115 / 170 | 0.1 | 20
Acrolein | 25 | 25% | C_{3}H_{4}O | 10 | 115 / 170 | 0.1 | 20

1Constant flow unless otherwise specified
2The inspired air temperature, measured at the facepiece, shall be less than or equal to 50°C (wet bulb) if the relative humidity is equal or greater than 50%. The inspired air temperature shall be less than or equal to 55°C (dry bulb) if the inspired air relative humidity is less than 50%.

Submitter’s Substantiation: NFPA 1984, as-written, requires NIOSH certification “as a wildland firefighting air-purifying respirator or as a wildland firefighting powered air-purifying respirator.” This NIOSH certification requirement is based on performance requirements and protections specifically developed by the wildland fire fighting task group. The present requirements contained in 42 C.F.R. Part 84 gives NIOSH the authority to approve respirators for protection against the combination of gas and vapor with particulates identified by NFPA for the protection of wildland fire fighters. In order to certify respirators using these existing authorities, test requirements must be added to NFPA 1984.

Emergency Nature: The collective protection approval for a wildland fire fighting respirator standard would require NIOSH to go through their formal rulemaking process. Although initiated approximately 12 months ago, it is anticipated to take at least another two years before a final rule would be completed. Manufacturers will not be able to submit products for approval until the effective date of the final rule. This means that NFPA/NIOSH-compliant wildland respirators will not be available to wildland fire fighters for several years. However, on the effective date of the TIA, manufacturers would be able to submit products to NIOSH for certification.
8.8 Breathing Resistance Test.

8.8.1 Application. This test method shall apply to all wildland fire fighting respirators with a tight-fitting facepiece.

8.8.2 Samples.

8.8.2.1 Samples shall be complete wildland fire fighting respirators.

8.8.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.8.3 Specimens.

8.8.3.1 Specimens shall be complete respirators.

8.8.3.2 At least three specimens shall be tested.

8.8.4 Procedure.

8.8.4.1 Testing shall be performed as specified in the applicable NIOSH test procedure.

8.8.4.2 PAPRs shall be tested with the blower turned off.

8.8.5 Report. Inhalation and exhalation resistance shall be recorded and reported for each test specimen.

8.8.6 Interpretation.

8.8.6.1 Inhalation and exhalation resistance shall be used to determine pass or fail performance.

8.8.6.2 One or more specimens failing this test shall constitute failing performance.

8.9 Air Purifying Respirator (APR) Air Purification Component Capacity Test.

8.9.1 Application. This test method shall apply to all non-powered wildland fire fighting respirators.

8.9.2 Samples.

8.9.2.1 Samples shall be air purifying components of wildland fire fighting respirators, or complete disposable wildland fire fighting respirators.

8.9.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.9.3 Specimens.

8.9.3.1 Specimens shall be the air purification component or components of wildland fire fighting respirators, or complete disposable respirators.

8.9.3.2 At least three specimens of each air purification component shall be tested.

8.9.4 Procedure. Testing shall be performed as specified in the applicable NIOSH test procedure.

***INSERT Table 8.9.4a HERE***

***INSERT Table 8.9.4b HERE***
8.9.5 Report. Breakthrough concentration shall be recorded and reported for each test specimen.
8.9.6 Interpretation.
8.9.6.1 Breakthrough concentration shall be used to determine pass or fail performance.
8.9.6.2 One or more specimens failing this test shall constitute failing performance.

8.10 Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test.
8.10.1 Application. This test method shall apply to all powered wildland fire fighting respirators.
8.10.2 Samples.
8.10.2.1 Samples shall be air purifying components of wildland fire fighting respirators.
8.10.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.
8.10.3 Specimens.
8.10.3.1 Specimens shall be the air purification component or components of wildland fire fighting respirators.
8.10.3.2 At least three specimens of each air purification component shall be tested.
8.10.4 Procedure. Testing shall be performed as specified in the applicable NIOSH test procedure.
8.10.5 Report. Breakthrough concentration shall be recorded and reported for each test specimen.
8.10.6 Interpretation.
8.10.6.1 Breakthrough concentration shall be used to determine pass or fail performance.
8.10.6.2 One or more specimens failing this test shall constitute failing performance.

***INSERT Table 8.10.4 HERE***

**Additional Proposed Changes**

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<thead>
<tr>
<th>File Name</th>
<th>Description</th>
<th>Approved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed_TIA_1984_Log_1017.docx</td>
<td>Balloted TIA includes tables</td>
<td></td>
</tr>
</tbody>
</table>

**Statement of Problem and Substantiation for Public Input**
NFPA 1984, as-written, requires NIOSH certification “as a wildland firefighting air-purifying respirator or as a wildland firefighting powered air-purifying respirator.” This NIOSH certification requirement is based on performance requirements and protections specifically developed by the wildland fire fighting task group. The present requirements contained in 42 C.F.R. Part 84 gives NIOSH the authority to approve respirators for protection against the combination of gas and vapor with particulates identified by NFPA for the protection of wildland fire fighters. In order to certify respirators using these existing authorities, test requirements must be added to NFPA 1984.

Emergency Nature: The collective protection approval for a wildland fire fighting respirator standard would require NIOSH to go through their formal rulemaking process. Although initiated approximately 12 months ago, it is anticipated to take at least another two years before a final rule would be completed. Manufacturers will not be able to submit products for approval until the effective date of the final rule. This means that NFPA/NIOSH-compliant wildland respirators will not be available to wildland fire fighters for several years. However, on the effective date of the TIA, manufacturers would be able to submit products to NIOSH for certification.

Submitter Information Verification

Submitter Full Name: TC on FAE-RPE
Organization: TC on Respiratory Protection Equipment
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Wed Jun 19 11:22:30 EDT 2013

Committee Statement

Resolution: FR-5-NFPA 1984-2014
Statement: NFPA 1984, as-written, requires NIOSH certification "as a wildland firefighting air-purifying respirator or as a wildland firefighting powered air-purifying respirator.” This NIOSH certification requirement is based on performance requirements and protections specifically developed by the wildland fire fighting task group. The present requirements contained in 42 C.F.R. Part 84 gives NIOSH the authority to approve respirators for protection against the combination of gas and vapor with particulates identified by NFPA for the protection of wildland fire fighters. In order to certify respirators using these existing authorities, test requirements must be added to NFPA 1984.

Emergency Nature: The collective protection approval for a wildland fire fighting respirator standard would require NIOSH to go through their formal rulemaking process. Although initiated approximately 12 months ago, it is anticipated to take at least another two years before a final rule would be completed. Manufacturers will not be able to submit products for approval until the effective date of the final rule. This means that NFPA/NIOSH-compliant wildland respirators will not be available to wildland fire fighters for several years. However, on the effective date of the TIA, manufacturers would be able to submit products to NIOSH for certification.
1. Revise 4.1.2 and A.4.1.2 to read as follows:

**4.1.2** Prior to certification of wildland fire fighting respirators to this standard, respirators shall be certified by NIOSH as an **"wildland fire fighting air-purifying respirator"** or as a **"wildland fire fighting powered air-purifying respirator."**

**A.4.1.2** Respirators certified by NIOSH in accordance with 42 CFR Part 84 as a wildland fire fighting air-purifying respirator (APR), or as a wildland fire fighting powered air-purifying respirator (PAPR) will be approved under a collective protection approval. In addition to the breathing resistance and gas and vapor performance requirements specified in 7.1.8 through 7.3, NIOSH testing includes the following:

- **NIOSH testing includes the following:**
  - **Breathing resistance (APR and Tight-Fitting PAPR only):** Inhalation and exhalation resistance at 150 lpm constant flow with a maximum inhalation resistance of 80 mm water column and a maximum exhalation resistance of 25 mm water column, with the PAPR blower turned off during testing. Note: NIOSH does not test breathing resistance on loose-fitting PAPR.
  - **Facepiece Carbon Dioxide Concentration:** Verification that the respiratory inlet covering carbon dioxide concentration does not exceed 1.0 percent.
  - **Gas and vapor testing:** Protection against the following gases and vapors: Carbon monoxide, Organic vapors, Formaldehyde, Acrolein, Sulfur Dioxide, Nitrogen Dioxide
  - **Particulate filter efficiency:** Minimum NIOSH-certified R95 particulate filter efficiency level. A filter medium that removes at least 95 percent of an aerosol of dioctylphthalate (DOP) having a mass median aerodynamic diameter of 0.3 μm, at a maximum challenge loading of 200 mg are R95 filters.
  - **Powered air purifying respirator power supply life:** Verification that the power source provides at least 8 hours of continuous use without recharging or replacement.

2. Revise 6.1.2 to read as follows:

**6.1.2** Prior to certification of wildland fire fighting respirators to the requirements of this standard, all respirators shall first be certified by NIOSH as either a wildland fire fighting APR, or as a wildland firefighting PAPR in accordance with 42 CFR 84.

3. Add the following to Chapter 7:

**7.1.8** All wildland fire fighting respirators with a tight-fitting facepiece shall be tested for breathing resistance as specified in Section 8.8, Breathing Resistance Test. The inhalation resistance shall not exceed 80 mm water column and the exhalation resistance shall not exceed 25 mm water column when tested at 150 lpm.

**7.2** Air-purifying respirator (APR) air purification components shall be tested for gas and vapor capacity as specified in the applicable test methods in Section 8.9, Air Purifying Respirator (APR) Air Purification Component Capacity Test, and the breakthrough concentration for each test representative agent shall not exceed the applicable values specified in Table 8.9.4a and Table 8.9.4b.

**7.3** Powered-air-purifying respirator (PAPR) air purification components shall be tested for gas and vapor capacity as specified in the applicable test methods in Section 8.10, Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test, and the breakthrough concentration for each test representative agent shall not exceed the applicable values specified in Table 8.10.4.

4. Add the following to Chapter 8:
8.8 Breathing Resistance Test.

8.8.1 Application. This test method shall apply to all wildland fire fighting respirators with a tight-fitting facepiece.

8.8.2 Samples.

8.8.2.1 Samples shall be complete wildland fire fighting respirators.

8.8.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.8.3 Specimens.

8.8.3.1 Specimens shall be complete respirators.

8.8.3.2 At least three specimens shall be tested.

8.8.4 Procedure.

8.8.4.1 Testing shall be performed as specified in the applicable NIOSH test procedure.

8.8.4.2 PAPRs shall be tested with the blower turned off.

8.8.5 Report. Inhalation and exhalation resistance shall be recorded and reported for each test specimen.

8.8.6 Interpretation.

8.8.6.1 Inhalation and exhalation resistance shall be used to determine pass or fail performance.

8.8.6.2 One or more specimens failing this test shall constitute failing performance.

8.9 Air Purifying Respirator (APR) Air Purification Component Capacity Test.

8.9.1 Application. This test method shall apply to all non-powered wildland fire fighting respirators.

8.9.2 Samples.

8.9.2.1 Samples shall be air purifying components of wildland fire fighting respirators, or complete disposable wildland fire fighting respirators.

8.9.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.9.3 Specimens.

8.9.3.1 Specimens shall be the air purification component or components of wildland fire fighting respirators, or complete disposable respirators.

8.9.3.2 At least three specimens of each air purification component shall be tested.

8.9.4 Procedure. Testing shall be performed as specified in the applicable NIOSH test procedure.

8.9.5 Report. Breakthrough concentration shall be recorded and reported for each test specimen.

8.9.6 Interpretation.

8.9.6.1 Breakthrough concentration shall be used to determine pass or fail performance.
8.9.6.2 One or more specimens failing this test shall constitute failing performance.

8.10 Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test.

8.10.1 Application. This test method shall apply to all powered wildland fire fighting respirators.

8.10.2 Samples.

8.10.2.1 Samples shall be air purifying components of wildland fire fighting respirators.

8.10.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.10.3 Specimens.

8.10.3.1 Specimens shall be the air purification component or components of wildland fire fighting respirators.

8.10.3.2 At least three specimens of each air purification component shall be tested.

8.10.4 Procedure. Testing shall be performed as specified in the applicable NIOSH test procedure.

8.10.5 Report. Breakthrough concentration shall be recorded and reported for each test specimen.

8.10.6 Interpretation.

8.10.6.1 Breakthrough concentration shall be used to determine pass or fail performance.

8.10.6.2 One or more specimens failing this test shall constitute failing performance.

Table 8.9.4a Air Purifying Respirator (APR) Air Purification Component Capacity Test Requirements

<table>
<thead>
<tr>
<th>Protection</th>
<th>Test Temp. (°C)</th>
<th>Test RH</th>
<th>Gas/ vapor</th>
<th>Challenge Concentration (ppm)</th>
<th>Flow rate (lpm)</th>
<th>Penetration (ppm)</th>
<th>Minimum Service Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>64</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>64</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>240, storage for 20 hours, 240</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>64</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 768 mL cumulative</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>64</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 60 mL cumulative²</td>
<td>60</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>80%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>64</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>25%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>64</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>80%</td>
<td>SO₂</td>
<td>50</td>
<td>64</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>25%</td>
<td>SO₂</td>
<td>50</td>
<td>64</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>80%</td>
<td>NO₂</td>
<td>25</td>
<td>64</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>30</td>
</tr>
</tbody>
</table>
Table 8.9.4b Air Purifying Respirator (APR) Air Purification Component Residence Test Requirements

<table>
<thead>
<tr>
<th>Protection</th>
<th>Test Temp. (°C)</th>
<th>Test RH</th>
<th>Gas/ Vapor</th>
<th>Challenge Concentration (ppm)</th>
<th>Flow rate (lpm)</th>
<th>Penetration (ppm)</th>
<th>Minimum Service Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>80%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>110</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>25%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>110</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>80%</td>
<td>SO₂</td>
<td>50</td>
<td>110</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>25%</td>
<td>SO₂</td>
<td>50</td>
<td>110</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>80%</td>
<td>NO₂</td>
<td>25</td>
<td>110</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>5</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>25%</td>
<td>NO₂</td>
<td>25</td>
<td>110</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>5</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>80%</td>
<td>HCHO</td>
<td>50</td>
<td>110</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>25%</td>
<td>HCHO</td>
<td>50</td>
<td>110</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Acrolein</td>
<td>25</td>
<td>80%</td>
<td>C₃H₄O</td>
<td>10</td>
<td>110</td>
<td>0.1</td>
<td>5</td>
</tr>
<tr>
<td>Acrolein</td>
<td>25</td>
<td>25%</td>
<td>C₃H₄O</td>
<td>10</td>
<td>110</td>
<td>0.1</td>
<td>5</td>
</tr>
</tbody>
</table>

1Constant flow unless otherwise specified
2The inspired air temperature, measured at the facepiece, shall be less than or equal to 50°C (wet bulb) if the relative humidity is equal or greater than 50%. The inspired air temperature shall be less than or equal to 55°C (dry bulb) if the inspired air relative humidity is less than 50%.

Table 8.10.4 Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test Requirements

<table>
<thead>
<tr>
<th>Protection</th>
<th>Test Temp. (°C)</th>
<th>Test RH</th>
<th>Gas/ vapor</th>
<th>Challenge Concentration (ppm)</th>
<th>Flow rate¹ (lpm)</th>
<th>Penetration (ppm)</th>
<th>Minimum Service Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>115 / 170</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>115 / 170</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>240, storage for 20 hours, 240</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>115 / 170</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 1380 / 2040 mL cumulative</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>115 / 170</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 60 mL cumulative²</td>
<td>60</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>80%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>115 / 170</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Compound</td>
<td>Flow</td>
<td>Concentration</td>
<td>Chemical Formula</td>
<td>TWA</td>
<td>ADI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>------</td>
<td>---------------</td>
<td>------------------</td>
<td>-----</td>
<td>-----</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>25%</td>
<td>C6H12</td>
<td>300</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>80%</td>
<td>SO2</td>
<td>50</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>25%</td>
<td>SO2</td>
<td>50</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>80%</td>
<td>NO2</td>
<td>25</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>25%</td>
<td>NO2</td>
<td>25</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>80%</td>
<td>HCHO</td>
<td>50</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>25%</td>
<td>HCHO</td>
<td>50</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acrolein</td>
<td>25</td>
<td>80%</td>
<td>C3H4O</td>
<td>10</td>
<td>0.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acrolein</td>
<td>25</td>
<td>25%</td>
<td>C3H4O</td>
<td>10</td>
<td>0.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1Constant flow unless otherwise specified
2The inspired air temperature, measured at the facepiece, shall be less than or equal to 50°C (wet bulb) if the relative humidity is equal or greater than 50%. The inspired air temperature shall be less than or equal to 55°C (dry bulb) if the inspired air relative humidity is less than 50%.

**Submitter’s Substantiation:** NFPA 1984, as-written, requires NIOSH certification “as a wildland firefighting air-purifying respirator or as a wildland firefighting powered air-purifying respirator.” This NIOSH certification requirement is based on performance requirements and protections specifically developed by the wildland fire fighting task group. The present requirements contained in 42 C.F.R. Part 84 gives NIOSH the authority to approve respirators for protection against the combination of gases and vapor with particulates identified by NFPA for the protection of wildland fire fighters. In order to certify respirators using these existing authorities, test requirements must be added to NFPA 1984.

**Emergency Nature:** The collective protection approval for a wildland fire fighting respirator standard would require NIOSH to go through their formal rulemaking process. Although initiated approximately 12 months ago, it is anticipated to take at least another two years before a final rule would be completed. Manufacturers will not be able to submit products for approval until the effective date of the final rule. This means that NFPA/NIOSH-compliant wildland respirators will not be available to wildland fire fighters for several years. However, on the effective date of the TIA, manufacturers would be able to submit products to NIOSH for certification.
Public Input No. 2-NFPA 1984-2013 [ Section No. A.4.1.2 ]

Note: This Proposal originates from Tentative Interim Amendment 1984-11-1 (TIA 1017) issued by the Standards Council on March 1, 2011.

A.4.1.2
Respirators certified by NIOSH in accordance with 42 CFR 84 as a wildland fire-fighting air-purifying respirator (APR), or as a wildland fire-fighting powered air-purifying respirator (PAPR) will be approved under a collective protection approval.

In addition to the breathing resistance and gas and vapor performance requirements specified in 7.1.8 through 7.3, NIOSH testing includes the following:

**Breathing resistance (APR and Tight-Fitting PAPR only):** Inhalation and exhalation resistance at 150 lpm constant flow with a maximum inhalation resistance of 80 mm water column and a maximum exhalation resistance of 25 mm water column, with the PAPR blower turned off during testing. Note: NIOSH does not test breathing resistance on loose-fitting PAPRs.

**Facepiece Carbon Dioxide Concentration:** Verification that the respiratory inlet covering carbon dioxide concentration does not exceed 1.0 percent.

**Gas and vapor testing:** Protection against the following gases and vapors: Carbon monoxide, organic vapors, formaldehyde, acrolein, sulfur dioxide, and nitrogen dioxide.

**Particulate filter efficiency:** Minimum NIOSH-certified R95 particulate filter efficiency level. A filter medium that removes at least 95 percent of an aerosol of dioctylphthalate (DOP) having a mass median aerodynamic diameter of 0.3 μm, at a maximum challenge loading of 200 mg are R95 filters.

**Powered air-purifying respirator power supply life:** Verification that the power source provides at least 8 hours of continuous use without recharging or replacement.

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**Additional Proposed Changes**

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<th>Description Approved</th>
</tr>
</thead>
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<td>Proposed_TIA_1984_Log_1017.docx</td>
<td>Balloted TIA</td>
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</tbody>
</table>

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

http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentParams=%28Comment...
NFPA 1984, as-written, requires NIOSH certification “as a wildland firefighting air-purifying respirator or as a wildland firefighting powered air-purifying respirator.” This NIOSH certification requirement is based on performance requirements and protections specifically developed by the wildland fire fighting task group. The present requirements contained in 42 C.F.R. Part 84 gives NIOSH the authority to approve respirators for protection against the combination of gas and vapor with particulates identified by NFPA for the protection of wildland fire fighters. In order to certify respirators using these existing authorities, test requirements must be added to NFPA 1984.

Emergency Nature: The collective protection approval for a wildland fire fighting respirator standard would require NIOSH to go through their formal rulemaking process. Although initiated approximately 12 months ago, it is anticipated to take at least another two years before a final rule would be completed. Manufacturers will not be able to submit products for approval until the effective date of the final rule. This means that NFPA/NIOSH-compliant wildland respirators will not be available to wildland fire fighters for several years. However, on the effective date of the TIA, manufacturers would be able to submit products to NIOSH for certification.

Submitter Information Verification

Submitter Full Name: TC on FAE-RPE
Organization: TC on Respiratory Protection Equipment
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 19 11:14:55 EDT 2013

Committee Statement

Resolution: FR-2-NFPA 1984-2014
Statement: NFPA 1984, as-written, requires NIOSH certification "as a wildland firefighting air-purifying respirator or as a wildland firefighting powered air-purifying respirator.” This NIOSH certification requirement is based on performance requirements and protections specifically developed by the wildland fire fighting task group. The present requirements contained in 42 C.F.R. Part 84 gives NIOSH the authority to approve respirators for protection against the combination of gas and vapor with particulates identified by NFPA for the protection of wildland fire fighters. In order to certify respirators using these existing authorities, test requirements must be added to NFPA 1984.

Emergency Nature: The collective protection approval for a wildland fire fighting respirator standard would require NIOSH to go through their formal rulemaking process. Although initiated approximately 12 months ago, it is anticipated to take at least another two years before a final rule would be completed. Manufacturers will not be able to submit products for approval until the effective date of the final rule. This means that NFPA/NIOSH-compliant wildland respirators will not be available to wildland fire fighters for several years. However, on the effective date of the TIA, manufacturers would be able to submit products to NIOSH for certification.
1. Revise 4.1.2 and A.4.1.2 to read as follows:

4.1.2* Prior to certification of wildland fire fighting respirators to this standard, respirators shall be certified by NIOSH as an “wildland fire fighting air-purifying respirator” or as a “wildland fire fighting powered air-purifying respirator.”

A.4.1.2 Respirators certified by NIOSH in accordance with 42 CFR Part 84 as a wildland fire fighting air-purifying respirator (APR), or as a wildland fire fighting powered air-purifying respirator (PAPR) will be approved under a collective protection approval. In addition to the breathing resistance and gas and vapor performance requirements specified in 7.1.8 through 7.3, NIOSH testing includes the following:

NIOSH testing includes the following:

**Breathing resistance (APR and Tight-Fitting PAPR only):** Inhalation and exhalation resistance at 150 lpm constant flow with a maximum inhalation resistance of 80 mm water column and a maximum exhalation resistance of 25 mm water column, with the PAPR blower turned off during testing. Note: NIOSH does not test breathing resistance on loose-fitting PAPRs.

**Facepiece Carbon Dioxide Concentration:** Verification that the respiratory inlet covering carbon dioxide concentration does not exceed 1.0 percent.

**Gas and vapor testing:** Protection against the following gases and vapors: Carbon monoxide, Organic vapors, Formaldehyde, Acrolein, Sulfur Dioxide, Nitrogen Dioxide.

**Particulate filter efficiency:** Minimum NIOSH-certified R95 particulate filter efficiency level. A filter medium that removes at least 95 percent of an aerosol of dioctylphthalate (DOP) having a mass median aerodynamic diameter of 0.3 μm, at a maximum challenge loading of 200 mg are R95 filters.

**Powered air purifying respirator power supply life:** Verification that the power source provides at least 8 hours of continuous use without recharging or replacement.

2. Revise 6.1.2 to read as follows:

6.1.2 Prior to certification of wildland fire fighting respirators to the requirements of this standard, all respirators shall first be certified by NIOSH as either a wildland fire fighting APR, or as a wildland firefighting PAPR in accordance with 42 CFR 84.

3. Add the following to Chapter 7:

7.1.8 All wildland fire fighting respirators with a tight-fitting facepiece shall be tested for breathing resistance as specified in Section 8.8, Breathing Resistance Test. The inhalation resistance shall not exceed 80 mm water column and the exhalation resistance shall not exceed 25 mm water column when tested at 150 lpm.

7.2 Air-purifying respirator (APR) air purification components shall be tested for gas and vapor capacity as specified in the applicable test methods in Section 8.9, Air Purifying Respirator (APR) Air Purification Component Capacity Test, and the breakthrough concentration for each test representative agent shall not exceed the applicable values specified in Table 8.9.4a and Table 8.9.4b.

7.3 Powered air-purifying respirator (PAPR) air purification components shall be tested for gas and vapor capacity as specified in the applicable test methods in Section 8.10, Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test, and the breakthrough concentration for each test representative agent shall not exceed the applicable values specified in Table 8.10.4.

4. Add the following to Chapter 8:
8.8 Breathing Resistance Test.

8.8.1 Application. This test method shall apply to all wildland fire fighting respirators with a tight-fitting facepiece.

8.8.2 Samples.

8.8.2.1 Samples shall be complete wildland fire fighting respirators.

8.8.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.8.3 Specimens.

8.8.3.1 Specimens shall be complete respirators.

8.8.3.2 At least three specimens shall be tested.

8.8.4 Procedure.

8.8.4.1 Testing shall be performed as specified in the applicable NIOSH test procedure.

8.8.4.2 PAPRs shall be tested with the blower turned off.

8.8.5 Report. Inhalation and exhalation resistance shall be recorded and reported for each test specimen.

8.8.6 Interpretation.

8.8.6.1 Inhalation and exhalation resistance shall be used to determine pass or fail performance.

8.8.6.2 One or more specimens failing this test shall constitute failing performance.

8.9 Air Purifying Respirator (APR) Air Purification Component Capacity Test.

8.9.1 Application. This test method shall apply to all non-powered wildland fire fighting respirators.

8.9.2 Samples.

8.9.2.1 Samples shall be air purifying components of wildland fire fighting respirators, or complete disposable wildland fire fighting respirators.

8.9.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.9.3 Specimens.

8.9.3.1 Specimens shall be the air purification component or components of wildland fire fighting respirators, or complete disposable respirators.

8.9.3.2 At least three specimens of each air purification component shall be tested.

8.9.4 Procedure. Testing shall be performed as specified in the applicable NIOSH test procedure.

8.9.5 Report. Breakthrough concentration shall be recorded and reported for each test specimen.

8.9.6 Interpretation.

8.9.6.1 Breakthrough concentration shall be used to determine pass or fail performance.
8.9.6.2 One or more specimens failing this test shall constitute failing performance.

8.10 Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test.

8.10.1 Application. This test method shall apply to all powered wildland fire fighting respirators.

8.10.2 Samples.

8.10.2.1 Samples shall be air purifying components of wildland fire fighting respirators.

8.10.2.2 Samples shall be conditioned as specified in the applicable NIOSH test procedure.

8.10.3 Specimens.

8.10.3.1 Specimens shall be the air purification component or components of wildland fire fighting respirators.

8.10.3.2 At least three specimens of each air purification component shall be tested.

8.10.4 Procedure. Testing shall be performed as specified in the applicable NIOSH test procedure.

8.10.5 Report. Breakthrough concentration shall be recorded and reported for each test specimen.

8.10.6 Interpretation.

8.10.6.1 Breakthrough concentration shall be used to determine pass or fail performance.

8.10.6.2 One or more specimens failing this test shall constitute failing performance.

Table 8.9.4a Air Purifying Respirator (APR) Air Purification Component Capacity Test Requirements

<table>
<thead>
<tr>
<th>Protection</th>
<th>Test Temp. (°C)</th>
<th>Test RH</th>
<th>Gas/ vapor</th>
<th>Challenge Concentration (ppm)</th>
<th>Flow rate(^1) (lpm)</th>
<th>Penetration (ppm)</th>
<th>Minimum Service Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>64</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide Intermittent use</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>64</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>240, storage for 20 hours, 240</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>64</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 768 mL cumulative</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide Inspiration Temperature</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>64</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 60 mL cumulative(^2)</td>
<td>60</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>80%</td>
<td>C(_6)H(_12)</td>
<td>300</td>
<td>64</td>
<td>10 ppm NO(_x) or 25 ppm NO</td>
<td>20</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>25%</td>
<td>C(_6)H(_12)</td>
<td>300</td>
<td>64</td>
<td>10 ppm NO(_x) or 25 ppm NO</td>
<td>20</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>80%</td>
<td>SO(_2)</td>
<td>50</td>
<td>64</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>25%</td>
<td>SO(_2)</td>
<td>50</td>
<td>64</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>80%</td>
<td>NO(_2)</td>
<td>25</td>
<td>64</td>
<td>1 ppm NO(_x) or 25 ppm NO</td>
<td>30</td>
</tr>
</tbody>
</table>
Nitrogen dioxide 25 25% NO₂ 25 64 1 ppm NO₂ or 25 ppm NO 30
Formaldehyde 25 25% HCHO 50 64 1 30
Formaldehyde 25 80% HCHO 50 64 1 30
Acrolein 25 25% C₃H₄O 10 64 0.1 20
1 ppm NO₂ or 25 ppm NO 30

Formaldehyde 25 25% HCHO 50 64 1 30
Acrolein 25 25% C₃H₄O 10 64 0.1 20
1 ppm NO₂ or 25 ppm NO 30

1 Constant flow unless otherwise specified
2 The inspired air temperature, measured at the facepiece, shall be less than or equal to 50°C (wet bulb) if the relative humidity is equal or greater than 50%. The inspired air temperature shall be less than or equal to 55°C (dry bulb) if the inspired air relative humidity is less than 50%.

Table 8.9.4b Air Purifying Respirator (APR) Air Purification Component Residence Test Requirements

<table>
<thead>
<tr>
<th>Protection</th>
<th>Test Temp. (°C)</th>
<th>Test RH</th>
<th>Gas/Vapor</th>
<th>Challenge Concentration (ppm)</th>
<th>Flow rate (lpm)</th>
<th>Penetration (ppm)</th>
<th>Minimum Service Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>80%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>110</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>25%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>110</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>80%</td>
<td>SO₂</td>
<td>50</td>
<td>110</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>25</td>
<td>25%</td>
<td>SO₂</td>
<td>50</td>
<td>110</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>80%</td>
<td>NO₂</td>
<td>25</td>
<td>110</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>5</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>25</td>
<td>25%</td>
<td>NO₂</td>
<td>25</td>
<td>110</td>
<td>1 ppm NO₂ or 25 ppm NO</td>
<td>5</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>80%</td>
<td>HCHO</td>
<td>50</td>
<td>110</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>25</td>
<td>25%</td>
<td>HCHO</td>
<td>50</td>
<td>110</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Acrolein</td>
<td>25</td>
<td>80%</td>
<td>C₃H₄O</td>
<td>10</td>
<td>110</td>
<td>0.1</td>
<td>5</td>
</tr>
<tr>
<td>Acrolein</td>
<td>25</td>
<td>25%</td>
<td>C₃H₄O</td>
<td>10</td>
<td>110</td>
<td>0.1</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 8.10.4 Powered Air Purifying Respirator (PAPR) Air Purification Component Capacity Test Requirements

<table>
<thead>
<tr>
<th>Protection</th>
<th>Test Temp. (°C)</th>
<th>Test RH</th>
<th>Gas/Vapor</th>
<th>Challenge Concentration (ppm)</th>
<th>Flow rate¹ (lpm)</th>
<th>Penetration (ppm)</th>
<th>Minimum Service Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>115 / 170</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>200</td>
<td>115 / 170</td>
<td>25 ppm averaged over a rolling 5 min time frame</td>
<td>240, storage for 20 hours, 240</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>115 / 170</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 1380 / 2040 mL cumulative</td>
<td>480</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>25</td>
<td>92%</td>
<td>CO</td>
<td>1200</td>
<td>115 / 170</td>
<td>200 ppm averaged over a rolling 5 min time frame &amp; 60 mL cumulative²</td>
<td>60</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>25</td>
<td>80%</td>
<td>C₆H₁₂</td>
<td>300</td>
<td>115 / 170</td>
<td>10</td>
<td>20</td>
</tr>
</tbody>
</table>

¹ Constant flow unless otherwise specified
² The inspired air temperature, measured at the facepiece, shall be less than or equal to 50°C (wet bulb) if the relative humidity is equal or greater than 50%. The inspired air temperature shall be less than or equal to 55°C (dry bulb) if the inspired air relative humidity is less than 50%.
<table>
<thead>
<tr>
<th>Compound</th>
<th>Mass %</th>
<th>Compound</th>
<th>Mass %</th>
<th>Vol %</th>
<th>Upper Limit</th>
<th>Pressure</th>
<th>T</th>
<th>Flow Rate</th>
</tr>
</thead>
</table>
| Organic Vapors    | 25     | C_6H_{12} | 25     | 300   | 115 / 170   | 10       | 20
| Sulfur Dioxide    | 25     | SO_2      | 80     | 50    | 115 / 170   | 5        | 30
| Sulfur Dioxide    | 25     | SO_2      | 25     | 50    | 115 / 170   | 5        | 30
| Nitrogen Dioxide  | 25     | NO_2      | 80     | 25    | 115 / 170   | 1 ppm NO_2 or 25 ppm NO | 30
| Nitrogen Dioxide  | 25     | NO_2      | 25     | 115 / 170 | 1 ppm NO_2 or 25 ppm NO | 30
| Formaldehyde      | 25     | HCHO      | 80     | 50    | 115 / 170   | 1        | 30
| Formaldehyde      | 25     | HCHO      | 25     | 115 / 170 | 1        | 30
| Acrolein          | 25     | C_3H_4O   | 80     | 10    | 115 / 170   | 0.1      | 20
| Acrolein          | 25     | C_3H_4O   | 25     | 115 / 170 | 0.1      | 20

1Constant flow unless otherwise specified
2The inspired air temperature, measured at the facepiece, shall be less than or equal to 50°C (wet bulb) if the relative humidity is equal or greater than 50%. The inspired air temperature shall be less than or equal to 55°C (dry bulb) if the inspired air relative humidity is less than 50%.

**Submitter’s Substantiation:** NFPA 1984, as-written, requires NIOSH certification “as a wildland firefighting air-purifying respirator or as a wildland firefighting powered air-purifying respirator.” This NIOSH certification requirement is based on performance requirements and protections specifically developed by the wildland fire fighting task group. The present requirements contained in 42 C.F.R. Part 84 gives NIOSH the authority to approve respirators for protection against the combination of gas and vapor with particulates identified by NFPA for the protection of wildland fire fighters. In order to certify respirators using these existing authorities, test requirements must be added to NFPA 1984.

**Emergency Nature:** The collective protection approval for a wildland fire fighting respirator standard would require NIOSH to go through their formal rulemaking process. Although initiated approximately 12 months ago, it is anticipated to take at least another two years before a final rule would be completed. Manufacturers will not be able to submit products for approval until the effective date of the final rule. This means that NFPA/NIOSH-compliant wildland respirators will not be available to wildland fire fighters for several years. However, on the effective date of the TIA, manufacturers would be able to submit products to NIOSH for certification.