Pursuant to Section 5 of the NFPA Regulations Governing Committee Projects, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, 2011 edition. The TIA was processed by the Technical Committee on Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, and was issued by the Standards Council on October 30, 2012, with an effective date of November 19, 2012.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a proposal of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. Revise 5.3.4.2.1 as follows:

   **5.3.4.2.1** For systems installed prior to September 30, 2012, listed antifreeze solutions shall not be required until September 30, 2022 where all of the following conditions are met:

   (1)* The concentration of the antifreeze solution shall be limited to 50% glycerin by volume or 40% propylene glycol by volume.
   (2) Newly introduced solutions shall be factory premixed antifreeze solutions (chemically pure or United States Pharmacopoeia 96.5%).
   (3)*Antifreeze systems with concentrations in excess of 30% propylene glycol and 38% glycerine shall be permitted based upon an approved deterministic risk assessment prepared by a qualified person approved by the AHJ.

2. Revise A.5.3.4.2.1 as follows:

   **A.5.3.4.2.1** It is assumed that all antifreeze systems installed after September 30, 2012 will meet the minimum requirements of NFPA 13, 2013 Edition. For systems installed after September 30, 2012, that do not meet the requirements of the 2013 edition of NFPA 13, consideration should be given to applying 5.3.4.2.1.

3. Revise A.5.3.4.2.1 (3) as follows:

   **A.5.3.4.2.1(3)** Antifreeze solutions with a maximum concentration of 38% glycerine or 30% propylene glycol do not require a deterministic hazard analysis. The risk assessment should be prepared by individual(s) who can
demonstrate an ability to prepare a risk assessment by education and experience and who can demonstrate an understanding of the issues associated with antifreeze sprinkler systems, including the available related fire tests. For additional information regarding the risk assessment process, documentation to be submitted, and the AHJ’s role, refer to NFPA 551, *Guide for the Evaluation of Fire Risk Assessments*, and the SFPE Engineering Guide: Fire Risk Assessment.

Propylene glycol and glycerin antifreeze solutions discharged from sprinklers have the potential to ignite under certain conditions. Research testing has indicated that several variables may influence the potential for large-scale ignition of the antifreeze solution discharged from a sprinkler. These variables include, but are not limited to, the concentration of antifreeze solution, sprinkler discharge characteristics, inlet pressure at the sprinkler, ceiling height, and size of fire at the time of sprinkler discharge. All relevant data and information should be carefully reviewed and considered in the deterministic risk assessment.

As appropriate, the risk assessment should consider factors such as:
1. Occupancy use group per NFPA 13
2. Ceiling height
3. Antifreeze solution concentration and type
4. Maximum system pressure (normal static pressures)
5. Sprinkler type, including k Factor
6. Potential and actual fuel load (Christmas trees)
7. Type of structure (construction types)
8. Size of structure
9. Ability of the sprinkler system to control the fire
10. Occupied spaces -vs- unoccupied spaces (such as trash enclosures, dust collectors…etc)
   a) Adjacent occupancies (spaces adjacent to the area protected by antifreeze systems)
   b) Separation between areas protected with an antifreeze system and other areas
   c) Ventilation of areas protected with an antifreeze system to prevent damage to adjacent areas
   d) Duration of antifreeze discharge

Tests summarized in Table A.5.3.4.2.1(3) show that large-scale ignition of the sprinkler spray did not occur in tests with 50% glycerine and 40% propylene glycol antifreeze solutions discharging onto a fire having a nominal Heat Release Rate (HRR) of 1.4 MW. A deterministic risk assessment that demonstrates that the heat release rate for reasonably credible fire scenarios will be less than 1.4 MW at the time of sprinkler activation should be acceptable. The risk assessment should also address issues associated with management of change, such as change in occupancy and temporary fuel loads. A natural Christmas tree can result in a HRR well above 1.4 MW at the time of sprinkler activation.

In addition to the variables identified above, the deterministic risk assessment should include the overall impact on life safety and potential increase in heat release rate.

The following is a list of research reports that have been issued by the Fire Protection Research Foundation related to the use of antifreeze in sprinkler systems that should be considered in the development of the deterministic risk assessment:

Table A.5.3.4.2.1(3) provides an overview of the testing

<table>
<thead>
<tr>
<th>Topic</th>
<th>Information</th>
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<tbody>
<tr>
<td>Scope of Sprinklers Tested</td>
<td>The following sprinklers were used during the residential sprinkler research program described in the report dated December 2010: • Residential pendent style having nominal K-factors of 3.1, 4.9 and 7.4 gpm/psi • Residential concealed pendent style having a nominal K-factor of 4.9 gpm/psi 1/2 • Residential sidewall style having nominal K-factors of 4.2 and 5.5 gpm/psi ½. The following sprinklers were used during the spray sprinkler research program described in the report dated February 2012: • Residential pendent style having a nominal K-factor of 3.1 gpm/psi • Standard spray pendent style having nominal K-factors of 2.8, 4.2, 5.6 and 8.0 gpm/psi 1/2 • Standard spray concealed pendent style having a nominal K-factor of 5.6 gpm/psi 1/2 • Standard spray upright style having a nominal K-factor of 5.6 gpm/psi 1/2 • Standard spray extended coverage pendent style having a nominal K-factor of 5.6 gpm/psi 1/2 1/2</td>
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</table>
| Antifreeze Solution Concentration          | <50% Glycerine and <40% Propylene Glycol Antifreeze Solutions — Solutions were not tested.  
50% Glycerine and 40% Propylene Glycol Antifreeze Solutions — Large scale ignition of the sprinkler spray did not occur in tests with sprinkler discharge onto a fire having a nominal Heat Release Rate (HRR) of 1.4 MW. Large scale ignition of the sprinkler spray occurred in multiple tests with sprinkler discharge onto a fire having a nominal HRR of 3.0 MW.  
55% Glycerine and 45% Propylene Glycol Antifreeze Solutions — Large scale ignition of the sprinkler spray occurred in tests with sprinkler discharge onto a fire having a nominal HRR of 1.4 MW.  
>55% Glycerine and >45% Propylene Glycol Antifreeze Solutions — Large scale ignition of the sprinkler spray occurred in tests with sprinkler discharge onto a fire having a HRR of less than 500 kW.  
70% Glycerine and 60% Propylene Glycol Antifreeze Solutions — Maximum antifreeze solution concentrations tested. |
| Sprinkler Inlet Pressure                   | Large scale ignition of the sprinkler discharge spray was not observed when the sprinkler inlet pressure was 50 psi or less for tests using 50% glycerine or 40% propylene glycol. |
| Ceiling Height                             | When discharging 50% glycerine and 40% propylene glycol antifreeze solutions onto fires having a HRR of 1.4 MW, no large scale ignition of the sprinkler spray was observed with ceiling heights up to 20 ft.  
When discharging 50% glycerine and 40% propylene glycol antifreeze solutions onto fires having a HRR of 3.0 MW, large scale ignition of the sprinkler spray was observed at a ceiling height of 20 ft. |
| Fire Control                               | The test results described in the test reports December 2010 and February 2012 indicated that discharging glycerine and propylene glycol antifreeze solutions onto a fire can temporarily increase the fire size until water is discharged.  
As a part of the residential sprinkler research described in report dated December 2010, tests were conducted to evaluate the effectiveness of residential sprinklers to control fires involving furniture and simulated furniture. The results of these tests indicated that 50% glycerine and 40% propylene glycol antifreeze solutions demonstrated the ability to control the furniture type fires in a manner similar to water. For standard spray type sprinklers, no tests were conducted to investigate the ability of these sprinklers to control the types and sizes of fires that these sprinklers are intended to protect. |

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Effective Date: November 19, 2012

(Note: For further information on NFPA Codes and Standards, please see www.nfpa.org/codelist)

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