

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555-0001

August 10, 1995

**NRC INFORMATION NOTICE 95-32: THERMO-LAG 330-1 FLAME SPREAD TEST RESULTS**

Addressees

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees to the results of the NRC flame spread tests of Thermo-Lag 330-1 fire barrier panels. It is expected that recipients will review the information for applicability to their facilities and consider this information, as appropriate, in their review of Thermo-Lag 330-1 fire barriers. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

On January 12, 1995, the NRC Staff conducted two flame spread tests of Thermo-Lag 330-1 panels at U.S. Testing, Fairfield, New Jersey. The National Institute of Standards and Technology provided technical assistance. The tests were conducted in accordance with American Society of Testing Materials E84 (ASTM E84), "Surface Burning Characteristics of Building Materials," 1994, which is the test method referenced in the NRC fire protection guidance documents.

Both of the Thermo-Lag test specimens were constructed of 5/8-inch nominal thickness Thermo-Lag 330-1 panels. A nominal 20-inch wide by 25-foot long Thermo-Lag specimen was placed in the top of the tunnel furnace in a face-down position. The test specimen becomes the furnace ceiling. A gas burner at one end of the furnace provided about 5,000 Btus per minute for the 10-minute test period. An inducted air flow pulled the gas flame downstream. Flame travel along the surface of the Thermo-Lag specimen was observed through windows in the side of the furnace. The test laboratory calculated the flame spread ratings on the basis of the distance the flame traveled down the test specimen and the elapsed time for maximum flame spread.

The Thermo-Lag panels for the first test specimen were purchased from Texas Utilities Electric Company from warehouse stock for the Comanche Peak plant. These panels were coated at the point of manufacture with a latex top coat that was applied by Thermal Science, Inc. (TSI), the manufacturer and supplier of Thermo-Lag fire barrier materials. The maximum flame spread measured was about 2.4 meters [8 feet] at 1 minute and 23 seconds into the test.

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This measurement equated to a flame spread rating of 37. The Thermo-Lag panels for the second test specimen, which were purchased from TSI, were not topcoated. The maximum flame spread measured for this specimen was 2.4 meters [8 feet] at 7 minutes and 20 seconds into the test. This measurement equated to a flame spread rating of 25.

### Discussion

Flame spread tests are used to determine the surface burning characteristics of materials when exposed to a test fire. Flame spread test results are used to compare the surface burning characteristics of different materials and are one consideration in assessments of the fire hazard introduced when a material is used in an area. The higher the numerical flame spread rating, the greater the flammability hazard. For example, cement-asbestos board and red oak flooring, which are used to calibrate the test furnace, have flame spread ratings of 0 and 100, respectively.

NRC staff guidelines regarding flame spread are contained in several NRC documents. For example, although it is not directly applicable to fire barriers, Branch Technical Position APCSB 9.5-1 states, in part, that "[i]nterior wall and structural components, thermal insulation materials, and radiation shielding materials and sound-proofing should be non-combustible. Interior finishes should be non-combustible or listed by a nationally recognized testing laboratory...for a flame spread 25 or less...." In addition, Standard Review Plan 9.5.1 addresses flame spread in its definition of noncombustible materials. It states, in part, that a noncombustible material has "a structural base of noncombustible material...with a surfacing not over 1/8-inch thick that has a flame spread rating not higher than 50...."

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Dennis M. Crutchfield, Director  
Division of Reactor Program Management  
Office of Nuclear Reactor Regulation

Technical contact: Patrick M. Madden, NRR  
(301) 415-2854

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| 95-27                  | NRC Review of Nuclear Energy Institute, "Thermo-Lag 330-1 Combustibility Evaluation Methodology Plant Screening Guide" | 05/31/95         | All holders of OLs or CPs for nuclear power plants.   |
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OL = Operating License  
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This measurement equated to a flame spread rating of 37. The Thermo-Lag panels for the second test specimen, which were purchased from TSI, were not topcoated. The maximum flame spread measured for this specimen was 2.4 meters [8 feet] at 7 minutes and 20 seconds into the test. This measurement equated to a flame spread rating of 25.

Discussion

Flame spread tests are used to determine the surface burning characteristics of materials when exposed to a test fire. Flame spread test results are used to compare the surface burning characteristics of different materials and are one consideration in assessments of the fire hazard introduced when a material is used in an area. The higher the numerical flame spread rating, the greater the flammability hazard. For example, cement-asbestos board and red oak flooring, which are used to calibrate the test furnace, have flame spread ratings of 0 and 100, respectively.

NRC staff guidelines regarding flame spread are contained in several NRC documents. For example, although it is not directly applicable to fire barriers, Branch Technical Position APCSB 9.5-1 states, in part, that "[i]nterior wall and structural components, thermal insulation materials, and radiation shielding materials and sound-proofing should be non-combustible. Interior finishes should be non-combustible or listed by a nationally recognized testing laboratory...for a flame spread 25 or less...." In addition, Standard Review Plan 9.5.1 addresses flame spread in its definition of noncombustible materials. It states, in part, that a noncombustible material has "a structural base of noncombustible material...with a surfacing not over 1/8-inch thick that has a flame spread rating not higher than 50...."

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