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PROPOSED RULE PR-Misc Notice Reg Guide

September 19, 1979

Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attn: Director, Division of Technical
Information and Document Control

Subject: Comments on Task RS 809-5 Div. 1
"Qualification Test for Cable Penetration
Fire Stops for Use in Nuclear Power Plants"

Dear Sir:

Commonwealth Edison Company has reviewed the above referenced Regulatory Guide and hereby submits comments on the enclosed pages.

Yours truly,

A. Wanninger

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Enclosures

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Acknowledged by card. 9/28

Comments on NRC Draft Regulatory Guide
"Qualification Test for Cable Penetration
Fire Stops for Use in Nuclear Power Plants"
Task RS 809-5 Dated July 1979

1. Section B - Discussion

In Section B Discussion, the draft regulatory guide is ambiguous because it mixes the words "barriers", "assemblies", and "cable penetrations". The following sentences are suggested as minor modifications which will improve the clarity:

> In a nuclear power plant, cables and cable raceways penetrate such barriers as walls, floors, or floor-ceiling(s) throughout the plant. When these barriers are rated as fire-resistive barriers, the cable penetration(s) assemblies should have the same resistance to fire as the barriers. (Barriers may have a fire-rating that exceeds the rating necessary to contain the "worst-case" fire at that location, as a result of other structural features. The fire resistance rating of the cable penetration assemblies shall be at least as great as that which has been determined to be necessary by the Fire Hazard Analysis.)

The modifications that are suggested above were apparently considered by the writers of the draft, since reference is made to "fire stops rated at one hour or less" in Subparagraph 4 of Section C.

2. Section C - Regulatory Position
Subparagraph C.2.b

This paragraph would require that tests be conducted under positive pressure conditions in the test furnace. Most tests to date have been conducted in a near-neutral pressure condition. Dependent on the pressures involved, performing tests under such conditions would be very difficult with testing equipment presently used. In lieu of the above, the ability of a fire stop to withstand pressure could be assessed from the results of hose stream tests with the exception of being able to determine if a positive air seal is maintained.

3. Section C - Regulatory Position
Subparagraph 2.c

This section would be of little significance since Subparagraph 1 already passes a bare conductor through the fire stop and would yield all the necessary information for a bare conductor close to the surface of the fire stop.

4. Section C - Regulatory Position
Subparagraph 3

This paragraph deals with the intentional modification of an installed fire stop as might be required to install additional cables through an existing penetration. The paragraph requires that a modified prototype be successfully tested under similar conditions. It is suggested that when repairs are made with materials and a design identical to the original, that qualification by analysis should be allowed. Thus, there should be a sentence in Subparagraph 3 to allow qualification without a second fire test.

5. Section C - Regulatory Position
Subparagraph 4

The "fire-load" of ANSI A2.1 (ASTM E119) is dictated by the time-temperature curve prescribed in the standard. The addition of an additional two feet of combustible cable covering will not materially affect the thermal exposure of the sample. The fuel fire-load of the furnace would be decreased as the fire-load of the test sample is increased. Therefore, there is no need to require three feet of cable protrusion on the fire side instead of the currently prescribed one foot. The additional cable would only serve to make the testing more costly.

6. Section C - Regulatory Position
Subparagraph 5

This subparagraph states that "designs that are unsymmetrical with respect to the use and application of fire stop materials should be tested on both sides. Unsymmetrical fire stop wall designs should be tested from both sides. Unsymmetrical floor designs need only be fire tested or exposed from the underside. It is not reasonable to assume that a floor fire stop will be exposed to the same level of fire on the top side as on the bottom side (heat rises). This requirement should at least be modified to require both sides to be tested only if it can be shown that plant conditions warrant it.

7. Section C - Regulatory Position
Subparagraph 6

This subparagraph states that a minimum of three thermocouples should be used for each interface type within the penetration.

The use of three thermocouples is excessive. Test samples often include three cable types fitted within three cable tray type or size variation stopped with perhaps two fire stop details. This particular array would require approximately 100 thermocouples if three T/C's were required for each location.

As the number of variables being tested increases, the number of T/C's required to examine the thermal effects decreases because a pattern is discernible. It would seem that a reputable testing agent with their background in testing should have latitude to install the appropriate number of T/C's to acquire the appropriate information.

No reason is seen that a T/C be placed one inch from each interface type in that the temperature measured one inch away will obviously be lower.

Additionally in this subparagraph, an interface type is defined to be any physical contact between a specific pair of dissimilar materials. The guide should be modified to make it clear that the interface between cable insulation and the cable jacket is not an interface in this context. The scope of this requirement should be carefully reviewed and only the interfaces which would yield useful data should be monitored for temperature.

8. Section C - Regulatory Position
Subparagraph 8

This subparagraph states that the unexposed surface temperature should not exceed 600°F and that the temperature one inch away from each interface type should not exceed 400°F.

The IEEE 634 Standard states that the maximum temperature of outer cable covering, the cable penetration fire stop material or material in contact with the cable penetration fire stop should not exceed 700°F.

It is not clear from Subparagraph C.8 just where the temperature limited to 600°F is measured.

There is no technical basis for the 600°F limit or for the 400°F limit. The 700°F temperature maximum stated in IEEE 634 Paragraph 6.1.2 is 150 to 200°F below the self-ignition temperatures of cables which should provide adequate margin for a temperature limit. The Sandia cable tests indicate the self-ignition temperatures of cables to be in the range of 850 to 900°F.