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Department of Nuclear Energy

August 19, 1980

Mr. Robert L. Ferguson
Chemical Engineering
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

RE: Pilgrim, Fire Protection Review

Dear Bob:

Attached is Brookhaven National Laboratory's input of Item 3.1.19
for the Pilgrim facility.

Respectfully yours,

Robert E. Hall, Group Leader
Reactor Engineering Analysis

REH:EAM:sd
attachment

cc.: V. Benaroya wo/att.
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PILGRIM

Fire Protection Review

Item 3.1.19

Pilgrim SER Section 3.1.19 indicates that pipe and electrical cable penetration seals will be tested to determine their fire resistance ratings, and that lower-rated seals will be upgraded to 3 hours or the licensee will justify the acceptability of the lower rating.

By letter dated May 29, 1980, the licensee provided reports of three cable penetration seal fire tests. The first test, conducted on May 31, 1979 (report date January, 1980), determined the fire resistance of open-sleeve and metal conduit cable penetration seals comparable to existing plant designs. One penetration, Sleeve #5, failed because the temperature on the unexposed side exceeded 700°F. The second test, (report date March, 1980), determined the fire resistance of various modified plant designs for open sleeve and metal conduit cable penetration seals. Two penetration seals, Sleeves #2 and #4, both failed because flame passed through to the unexposed side and the temperature on the unexposed side exceeded 700°F. The third test determined the fire resistance of cable tray penetration seals comparable to existing plant designs. Penetration # 2 failed because flames passed through to the unexposed side, and the temperature on that side exceeded 700°F.

No pressure differential was used and we feel that a conservative test should include a pressure differential. However, the state-of-the-art is such that pressure differential testing is not widely available at this time. Therefore, it is our opinion that the test procedure and criteria are satisfactory as an interior solution until standardized test methods are developed.

In order to meet the requirements of the Appendix R III N, the licensee should verify that each cable penetration seal conforms to one of the tested designs that passed all applicable test criteria. In addition, the licensee should demonstrate that all pipe penetrations have a fire resistance rating of three hours (all of the tests in the May 29, 1980 submittal were for electrical penetrations).