BROOKHAVEN NATIONAL LABORATORY
ASSOCIATED UNIVERSITIES, INC.
Upton, New York 11973

Department of Nuclear Energy

(516) 345-2144

January 3, 1980

Mr. Robert L. Ferguson
Plant Systems Branch
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

RE: Millstone Unit 2 Power Plant
Fire Protection Review Item 3.2.3

Dear Bob:

Attached is the completed Fire Protection Review Item 3.2.3 - Fire Barrier Penetration Test Data.

Respectfully yours,

Robert E. Hall, Group Leader
Reactor Engineering Analysis

REH:lz
Enclosure
cc: R. Cerbone (wo/enc.)
W. Kato "
E. MacDougall "
V. Panciera (wo/enc.)
E. Sylvester

A006
S
1/1
ADD: R FERGUSON LE

Millstone Unit 2

FIRE PROTECTION REVIEW

Item 3.2.3 Fire Barrier Penetration Test Data

Section 3.2.3 of the SER indicates that the licensee will provide test data which demonstrates that the existing fire barrier penetration seals have a fire rating of three hours.

The licensee submitted, in their July 31, 1979 letter, test information on the Dow Corning Q3-6548 medium density Silicone RTV foam. The tests indicated that the material was subjected to the ASTM E119-73 Fire Endurance Test and successfully passed the test. The licensee did not indicate that the penetrations installed at the plant were similar to the tested penetration seals. The licensee was requested to submit a letter verifying that the plant's penetration was similar in construction to the ones tested.

The licensee responded to this request in a letter dated October 9, 1979. The installer of the penetration seals, Insulation Consultants and Management Services, Inc., certified that all the penetration seals had been installed to provide a three (3) hour fire rating. The only exceptions are in the switchgear room, and these will meet the one (1) hour fire rating as required in the SER.

The test procedure does not require positive pressure on the fire side; in actuality it is generally negative but as close to zero as possible.

The majority of testing on fire barrier penetrations to date has been conducted with negative pressure on the fire side. Most furnaces used for this testing are not designed to maintain any significant positive pressures on the fire side. Extensive modifications to the furnaces are necessary to conduct the tests.

IEEE Standard 634-1978 recognizes that a positive pressure on the fire side is desirable, but they also recognize that there has been no standard method proposed and accepted for checking the seal during fire tests.

Underwriters Laboratories, Inc. procedure, titled "ASTM Designation E, Standard Method of Fire Tests of Electrical and Mechanical Through-Penetration Fire Stops, July 28, 1977," also recognizes that a positive pressure on the fire side is desirable. However, due to the inability of many existing test furnaces to conduct fire tests under positive pressure, they recommend that the pressure on the fire side should be as close to atmospheric as possible.

There is a good possibility that the application of a Δp across the penetration will affect the outcome of the test, whichever way the Δp is applied. However, we are unable to find any data which substantiate a significant difference in test results. We do feel that this area deserves further exploration.

Further, to require a positive pressure on the fire side of the penetration seal under test would be inconsistent with the test methods used for determining the fire resistance ratings of wall and ceiling assemblies and protective devices for other wall and floor openings, e.g., fire doors, which are almost exclusively tested with a slightly negative pressure on the exposed side of the test specimen.

For these reasons, we recommend that the documentation for the penetration seals at Millstone Unit 2 be accepted.