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September 24, 1985

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Subject: McGuire Nuclear Station
Docket Nos. 50-369 and 50-370
Request for Exemption from 10 CFR 50 Appendix J Requirement

Dear Mr. Denton:

Attached is a Request for Exemption from the 10 CFR 50 Appendix J Requirement to leak rate test mechanical penetrations using air or nitrogen as the test medium across the valve sealing surface. This Request for Exemption pertains to two penetrations for the Ice Condenser Refrigeration System where it is otherwise necessary to drain approximately 200 gallons of glycol. An outline of the procedure is included in the request.

The proposal would allow an alternative means of testing whereby glycol would be used as the pressurization medium. If the acceptance criterion (zero leakage) is not met, the penetration will be fully drained and tested in accordance with Appendix J.

Review and approval is requested by February 1, 1986 to support the current test cycle. Pursuant to 10 CFR 170.21, a check for $150.00 is enclosed.

Please feel free to contact us if you require any additional information.

Very truly yours,

Hal B. Tucker

Hal B. Tucker

JBD/hrp

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Mr. W. T. Orders
NRC Resident Inspector
McGuire Nuclear Station

A017 w/check $150
1/1 #18204138

Request for Exemption from 10CFR50 Appendix J Requirement

10CFR50 Appendix J III C 2(a) requires mechanical penetrations to be leak rate tested using air or nitrogen as the test medium across the valve sealing surface. An exemption is requested from this requirement for penetration numbers M-372 and M-373. The local leakage test will be performed without draining the glycol from the seats of the diaphram valves in these penetrations. Attachment A depicts the arrangement of these penetrations.

McGuire utilizes an ice condenser to surpress the peak accident pressure in the reactor containment building. The ice condenser is refrigerated by recirculating a 50% - 50% mixture of ethylene glycol and water through a series of air handling units located inside the containment building and chillers units located in the auxiliary building. Typically, draining, testing and refilling the system requires 24 to 36 hours of downtime for the ice condenser refrigeration system. This extended downtime potentially diminishes the amount of ice in the baskets. Draining the glycol consumes a significant number of manhours and creates toxic waste which has to be disposed.

As an alternative to draining the ~200 gallons of glycol necessary to perform this test in accordance with Appendix J, the following procedure for testing these penetrations is proposed. Penetration M-373 would be drained through NF-1173 and NF-960. NF-229 (a duo check valve) would be local leak tested with air on both sides. NF-228A would then be tested with air as the pressurization medium and glycol on its seats. The system high point vent, NF-1150, would serve as the vent valve for NF-228A. Similarly, M-372 would be tested without completely draining the glycol. NF-233B would be tested by pressurizing through NF-957 utilizing NF-236 as the test vent. NF-234A would be pressurized through NF-957 utilizing NF-1150 as the test vent.

NF-228A, NF-233B and NF-234A are diaphragm valves which have an excellent history of leak tightness. This characteristic is primarily due to the resiliency of the rubber diaphragm. If a rupture of the diaphragm were to occur, it would be evident via leakage around the valve stem due to the static pressure maintained on the glycol system.

A bench test was performed at McGuire to corrolate the leakage rate of air and the Glycol/Water mixture. A test stand was fabricated using a metering valve to achieve a repeatable leakage area. The upstream side was pressurized to 15 psig, the downstream side discharged to atmosphere and temperature was held constant at 75 degrees F. The following results were obtained:

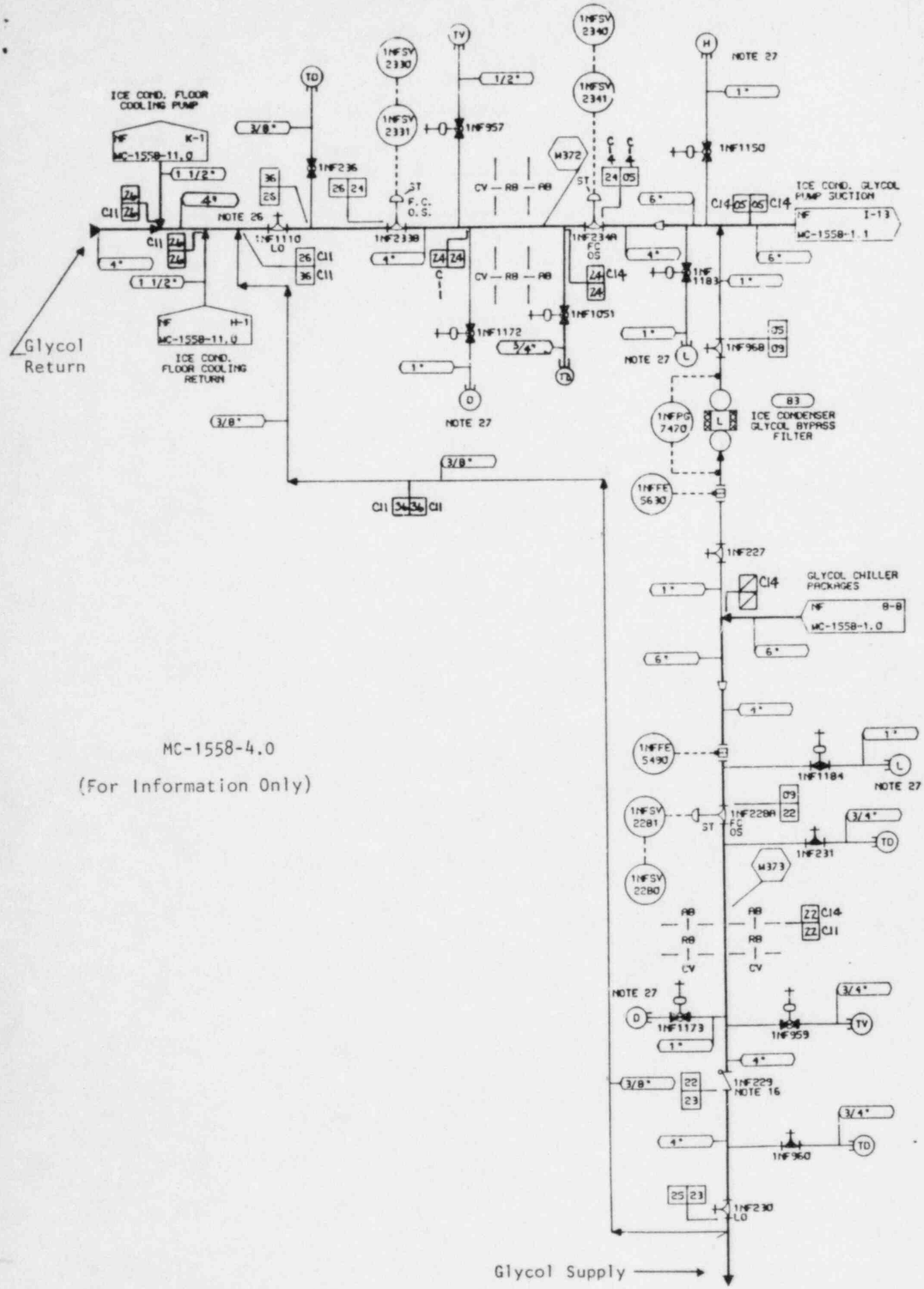
AIR LEAK RATE (SCCM)	WATER/GLYCOL LEAK RATE (SCCM)
500	15
1000	28
1500	47

These results infer a 1 to 31 glycol to air leakage ratio with a .994 correlation coefficient. This ratio will be different at different temperatures due to changes in kinematic viscosity.

The leakage rate acceptance criteria that would be imposed on these diaphragm valves would be zero indicated leakage (not including instrument error).

If the leak rate is greater than zero, the penetration will be fully drained and the valves leak tested in accordance with Appendix J. Performing the local leakage rate test on these penetrations without fully draining them will not compromise containment integrity.

Attachment A



MC-1558-4.0

(For Information Only)