DOCKET NO. 50-245

ATTACHMENT

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 1

PROPOSED TECHNICAL SPECIFICATION CHANGE FOR

PRIMARY CONTAINMENT INTEGRATED LEAK RATE TESTING

OCTOBER, 1980

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
3. Primary containment integrity as defined in Section 1.0 shall be maintained at all times when the reactor is critical or when the reactor water temperature is above 212°F and fuel is in the reactor vessel except while performing low power physics test at atmospheric pressure during or after refueling at power levels not to exceed 5 Mw(t).	3. Primary Containment Integrity a. Integrated Primary Containment Leak Test (IPCLT) The containment leakage rates shall be demonstrated at the following test schedule and shall be determined in conformance with the criteria specified in Appendix J of 10CFR50 using the methods and provisions of ANSI N45.4-1972: 1. Three Type A Overall Integrated Containment Leakage Rate tests shall be conducted at 40 ± 10 month intervals during shutdown at P_a (43 psig) during each ten-year service period. The third test of each set shall be conducted during the shutdown for the ten-year plant inservice inspection*. 2. If any periodic Type A test fails to meet 0.75 L_a, the test schedule for subsequent Type A tests shall be reviewed and approved by the Commission. If two consecutive Type A tests fail to meet 0.75 L_a, a Type A test shall be performed at least every 18 months until two consecutive Type A tests meet 0.75 L_a, at which time the above schedule may be resumed.

*The third test of the first ten-year service period shall be conducted during the 1980 refueling shutdown.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
	3. The accuracy of each Type A test shall be verified by a supplemental test which: a. Confirms the accuracy of the test by verifying that the difference between the supplemental data and the Type A test data is within 0.25 L_a. b. Has duration sufficient to establish accurately the change in leakage rate between the Type A test and the supplemental test. c. Requires the quantity of gas injected into containment or bled from containment during the supplemental test to be equivalent to at least 25 percent of the total measured leakage at P_a. 4. All test leakage rates shall be calculated using observed data converted to absolute values. Error analyses shall be performed to select a balanced integrated leakage measurements system.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
	b. Acceptance Criteria for IPCLT 1. The maximum allowable leak rate at P_a shall not exceed L_a (1.2 weight percent of the contained air per 24 hours). 2. The allowable operational leak rate, L_{to}, which shall be met prior to increasing reactor coolant system temperature above 212°F following a test (either as measured or following repairs and retest), shall not exceed 0.75 L_a. c. Corrective Action for IPCLT If leak repairs are necessary to meet the allowable operational leak rate, the integrated leak rate test need not be repeated provided local leak measurements are conducted and the leak rate differences prior to and after repairs, when corrected to P_a and deducted from the integrated leak rate measurements, yield a leakage rate value not in excess of the allowable operational leak rate L_{to}. d. (Intentionally Left Blank)

The design basis loss of coolant accident was evaluated at the primary containment maximum allowable accident leak rate of 1.5%/day at 43 psig. The analysis showed that with this leak rate and a standby gas treatment system filter efficiency of 90% for halogens, 95% for particulates, and assuming the fission product release fractions stated in TID-14844, the maximum total whole body passing cloud dose is about 5 rem and the maximum total thyroid dose is about 125 rem at the site boundary over an exposure duration of two hours. The resultant doses that would occur for the duration of the accident at the low population distance of 2.3 miles are 4 rem whole body and 155 rem maximum total thyroid dose. Thus, these doses reported are the maximum that would be expected in the unlikely event of a design basis loss of coolant accident. These doses are also based on the assumption of no holdup in the secondary containment resulting in a direct release of fission products from the primary containment through the filters and stack to the environs. Therefore, the specified primary containment leak rate and filter efficiency are conservative and provide margin between expected off-site doses and 10CFR100 guidelines. The fission product source term defined in TID-14844 was also used in the design of facility engineered safety features including shielding and filter sizing.

The maximum allowable test leak rate is 1.2%/day at a pressure of 43 psig. This value for the test condition was derived from the maximum allowable accident leak rate of about 1.5%/day when corrected for the effects of containment environment under accident and test conditions. In the accident case, the containment atmosphere initially would be composed of steam and hot air depleted of oxygen whereas under test conditions the test atmosphere would be air or nitrogen at ambient conditions. Considering the differences in mixture composition and temperatures, the appropriate correction factor applied was 0.8 and determined from the guide on containment testing(1).

Although the dose calculations suggest that the accident leak rate could be allowed to increase to about 3.0%/day, before the guidelines thyroid dose value given in 10CFR100 would be exceeded, establishing the test limit of 1.2%/day provides an adequate margin of safety to assure the health and safety of the general public. It is further considered that the allowable leak rate should not deviate significantly from the containment design value to take advantage of the design leak-tightness capability of the structure over its service lifetime. Additional margin to maintain the containment in the "as-built" condition is achieved by establishing the allowable operational leak rate. The operational limit is derived by multiplying the allowable test leak rate by 0.75 thereby providing a 25% margin to allow for leakage deterioration which may occur during the period between leak rate tests.

The requirements for integrated primary containment leak tests have been revised to conform with 10CFR Part 50, Appendix J and ANSI N45.4-1972. (The third test of the first ten-year service period shall be conducted during the 1980 refueling shutdown to provide an orderly transition to the Appendix J schedule requirements.)

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(1) TID-20583, Leakage Characteristics of Steel Containment Vessel and the Analysis of Leakage Rate Determinations.