ATTACHMENT 2

Letter from C.R. Steinhardt (WPSC)

To

Document Control Desk (NRC)

Dated

February 25, 1998

Proposed Amendment 151

Affected TS Pages:

TS ii and TS iv
TS 4.4-1 through TS 4.4-3
TS B4.4-1 through TS B4.4-3
TS 6.20-1

4.4 CONTAINMENT TESTS

APPLICABILITY

Applies to integrity testing of the steel containment, shield building, auxiliary building special ventilation zone, and the associated systems including isolation valves.

OBJECTIVE

To verify that leakage from the containment system is maintained within allowable limits in accordance with 10 CFR Part 50, Appendix J.

SPECIFICATION

a. Integrated Leak Rate Tests (Type A)

Perform required visual examinations and leakage rate testing in accordance with the Containment Leakage Rate Testing Program.

b. Local Leak Rate Tests (Type B and C)

Perform required air lock, penetration, and containment isolation valve leakage testing in accordance with the Containment Leakage Rate Testing Program.

c. Shield Building Ventilation System

1. At least once per operating cycle or once every 18 months, whichever occurs first, the following conditions shall be demonstrated:

   a. Pressure drop across the combined HEPA filters and charcoal adsorber banks is < 10 inches of water and the pressure drop across any HEPA filter bank is < 4 inches of water at the system design flow rate (±10%).

   b. Automatic initiation of each train of the system.

   c. Operability of heaters at rating and the absence of defects by visual observation.

2. Shield Building Ventilation System Filter Testing

   a. The in-place DOP test for HEPA filters shall be performed (1) at least once per 18 months and (2) after each complete or partial replacement of a HEPA filter bank or after any maintenance on the system that could affect the HEPA bank bypass leakage.

   b. The laboratory tests for activated carbon in the charcoal filters shall be performed (1) at least once per 18 months for filters in a standby status or after 720 hours of filter operation, and (2) following painting, fire, or chemical release in any ventilation zone communicating with the system.

   c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of a charcoal adsorber bank or after any maintenance on the system that could affect the charcoal adsorber bank bypass leakage.

   d. Each train shall be operated with the heaters on at least 10 hours every month.

3. An air distribution test on these HEPA filter banks will be performed after any maintenance or testing that could affect the air distribution within the systems. The test shall be performed at design flow rate (±10%). The results of the test shall show the air distribution is uniform within ±20%.[1]

4. Each train shall be determined to be operable at the time of its periodic test if it produces measurable indicated vacuum in the annulus within 2 minutes after initiation of a simulated safety injection signal and obtains equilibrium discharge conditions that demonstrate the Shield Building leakage is within acceptable limits.

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[1] In WPS letter of August 25, 1976 to Mr. Al Schwencer (NRC) from Mr. E. W. James, we relayed test results for flow distribution for tests performed in accordance with ANSI N510-1975. This standard refers to flow distribution tests performed upstream of filter assemblies. Since the test results upstream of filters were inconclusive due to high degree of turbulence, tests for flow distribution were performed downstream of filter assemblies with acceptable results (within 20%). The safety evaluation attached to Amendment 12 references our letter of August 25, 1976 and acknowledges acceptance of the test results.

d. Auxiliary Building Special Ventilation System

1. Periodic tests of the Auxiliary Building Special Ventilation System, including the door interlocks, shall be performed in accordance with TS 4.4.c.1 through TS 4.4.c.3, except for TS 4.4.c.2.d.

2. Each train of Auxiliary Building Special Ventilation System shall be operated with the heaters on at least 15 minutes every month.

3. Each system shall be determined to be operable at the time of periodic test if it starts with coincident isolation of the normal ventilation ducts and produces a measurable vacuum throughout the special ventilation zone with respect to the outside atmosphere.

e. Containment Vacuum Breaker System

The power-operated valve in each vent line shall be tested during each refueling outage to demonstrate that a simulated containment vacuum of 0.5 psig will open the valve and a simulated accident signal will close the valve. The check and butterfly valves will be leak tested in accordance with TS 4.4.b during each refueling, except that the pressure will be applied in a direction opposite to that which would occur post-LOCA.

BASIS

Background - Containment System

The Containment System is designed to provide protection for the public from the consequences of a Design Basis Accident.[1] The Design Basis Accident is an instantaneous double-ended rupture of the cold leg of the Reactor Coolant System. Pressure and temperature behavior subsequent to the accident was determined by calculations evaluating the combined influence of the energy sources, the heat sinks and engineered safety features. The assumptions and effects for containment vessel leakage rate are detailed in the USAR[2] and further amplified in one of its Appendices.[3]

The total containment system consists of two systems. The Primary Containment System consists of a steel structure and its associated engineered safety features systems. The Primary Containment System, also referred to as the Reactor Containment Vessel, is a low-leakage steel shell, including all of its penetrations, designed to confine the radioactive materials that could be released by accidental loss of integrity of the Reactor Coolant System pressure boundary. It is designed for a maximum internal/test pressure of 46 psig and a temperature of 268°F.

The Secondary Containment System consists of the Shield Building, its associated engineered safety features systems, and a Special Ventilation Zone in the Auxiliary Building. The Shield Building is a medium-leakage concrete structure surrounding the Reactor Containment Vessel and is designed to provide a means for collection and filtration of fission-product leakage from the Reactor Containment Vessel following the Design Basis Accident. A 5-ft. annular space is provided between the Reactor Containment Vessel and the Shield Building. The Shield Building Ventilation System is the engineered safety feature utilized for the collection and filtration of fission-product leakage from the containment vessel.

The Special Ventilation Zone of the Auxiliary Building provides a medium-leakage boundary which confines leakage that could conceivably bypass the Shield Building annulus. The safety system associated with the Auxiliary Building Special Ventilation Zone is the Auxiliary Building Special Ventilation System (ABSVS). One of the functions of the ABSVS is to collect and filter any potential fission products that may bypass the Shield Building annulus.

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[1] USAR Section 14.3

[2] USAR Section 14.3.5

[3] USAR Appendix H

Maintaining CONTAINMENT SYSTEM INTEGRITY in an OPERABLE state requires, among other conditions, that all the requirements of TS 4.4.a and b, leakage rate testing (Containment Leakage Rate Testing Program), are satisfied. The testing process will include: (1) an overall containment leak rate evaluation (Type A); (2) a determination of the leakage through pressure containing or leakage limiting boundaries (Type B); and (3) an evaluation of the leak rate through containment isolation valves (Type C).[41] These tests are intended to check all possible paths for containment atmosphere to reach the outside atmosphere.

Shield Building Ventilation System (TS 4.4.c)

Pressure drop across the combined HEPA filters and charcoal adsorbers of < 10 inches of water and an individual HEPA bank pressure drop of < 4 inches of water at the system design flow rate (±10%) will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. A test frequency of once per operating cycle establishes system performance capability. This pressure drop is approximately 6 inches of water when the filters are clean.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Replacement adsorbent should be qualified according to the guidelines of Regulatory Guide 1.52 (Rev. 1) dated June 1976. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly, and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. The use of multi-sample assemblies for test samples is an acceptable alternate to mixing one bed for a sample. If the iodine removal efficiency test results are unacceptable, all adsorbent in the system should be replaced. Any HEPA filters found defective should be replaced with filters qualified pursuant to Regulatory Position C.3.d of Regulatory Guide 1.52 (Rev. 1) dated June 1976.

If painting, fire, or chemical release occurs, the charcoal adsorber will be laboratory tested to determine whether it was contaminated from the fumes, chemicals, or foreign materials. Replacement of the charcoal adsorber can then be evaluated.

Operation of the systems every month will demonstrate operability of the filters and adsorber system. Operation of the Shield Building Ventilation System will result in a discharge to the environment. This discharge is made after at least three samples of the building atmosphere have been analyzed to determine the concentration of activity in the atmosphere.

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[41] 10 CFR Part 50, Appendix J, Option B

Auxiliary Building Special Ventilation System (TS 4.4.d)

Demonstration of the automatic initiation capability is necessary to assure system performance capability.[5]

Periodic checking of the inlet heaters and associated controls for each train will provide assurance that the system has the capability of reducing inlet air humidity so that charcoal adsorber efficiency is enhanced.

In-place testing procedures will be established utilizing applicable sections of ANSI N510-1975 standard as a procedural guideline.

Vacuum Breaker Valves (TS 4.4.e)

The vacuum breaker valves are 18 inch butterfly valves with air to open, spring to close operators. The valve discs are center pivot and rotate when closing to an EPT base material seat. When closed, the disc is positioned fully on the seat regardless of flow or pressure direction. Testing these valves in a direction opposite to that which would occur post-LOCA verifies leakage rates of both the vacuum breaker valves and the check valves downstream.

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[5] USAR Section 9.6

6.20 CONTAINMENT LEAKAGE RATE TESTING PROGRAM

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. The program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995. The provisions of TS 4.0.b do not apply to the test frequencies specified in the Containment Leakage Rate Testing Program. The provisions of TS 4.0.c are applicable to the Containment Leakage Rate Testing Program.

The peak calculated containment internal pressure for the design basis loss-of-coolant accident is less than the containment internal test pressure, P_a. The maximum allowable leakage rate (L_a) is 0.5 weight percent of the contained air per 24 hours at the peak test pressure (P_a) of 46 psig.

For penetrations which extend into the Auxiliary Building Special Ventilation Zone, the combined leak rate from these penetrations shall not exceed $0.10L_a$. For penetrations which are exterior to both the Shield Building and the Auxiliary Building Special Ventilation Zone, the combined leak rate from these penetrations shall not exceed $0.01L_a$. If leak rates are exceeded, repairs and retest shall be performed to demonstrate reduction of the combined leak rate to these values.

Leakage rate acceptance criteria:

a. The containment leakage rate acceptance criterion is $\leq 1.0L_a$.

b. Prior to unit startup following testing in accordance with this program, the leakage rate acceptance criteria are $< 0.6L_a$ for Type B and C tests and $< 0.75L_a$ for the Type A test.

c. The Personnel and Emergency Air Lock leakage rates, when combined with the cumulative Type B and C leakage, shall be $< 0.6L_a$. For each air lock door seal, the leakage rate shall be $< 0.005L_a$ when tested to $\geq$ 10 psig.