LIST OF TABLES

LIST OF TABLES (Cont'd)

1.6 INSTRUMENTATION SURVEILLANCE

1.6.1 Channel Check

A qualitative determination of acceptable operability by observation of channel behavior during operation. This determination shall include, where possible, comparison of the channel with other independent channels measuring the same variable.

1.6.2 Channel Functional Test

Injection of a simulated signal into the channel to verify that it is operable, including alarm and/or trip initiating action.

1.6.3 Channel Calibration

Adjustment of channel output such that it responds, with acceptable range and accuracy, to known values of the parameter which the channel measures. Calibration shall encompass the entire channel, including alarm or trip, and shall be deemed to include the channel functional test.

1.6.4 Source Check

A Source Check is the qualitative assessment of channel response when the channel sensor is exposed to a source of increased radioactivity.

1.7 CONTAINMENT INTEGRITY

Containment integrity is defined to exist when:

a. All non-automatic containment isolation valves which are not required to be open during accident conditions, except those required to be open for normal plant operation or testing, are closed and blind flanges are installed where required.

b. The equipment door is properly closed.

3.6 CONTAINMENT SYSTEM

Applicability

Applies to the integrity of reactor containment.

Objective

To define the operating status of the reactor containment for plant operation.

Specifications

A. CONTAINMENT INTEGRITY

1. The following requirements shall be satisfied: (a) whenever the reactor is above cold shutdown or (b) whenever the reactor vessel head is less than fully tensioned, and (i) the shutdown margin is <5% $\Delta k/k$, or (ii) the boron concentration within the reactor is less than 2000 ppm.

    a. All non-automatic containment isolation valves which are not required to be open during accident conditions are closed and blind flanges installed where required. Non-automatic containment isolation valves and any test connection valves which are located between containment isolation valves and which are normally closed with threaded caps or blind flanges installed, may be opened with administrative controls if necessary for plant operation or for testing and only as long as necessary to perform the intended function.

    b. All automatic containment isolation valves are either operable or in the closed position or isolated by a closed manual valve or flange that meets the same design criteria as the isolation valve.

    c. The equipment door is properly closed.

    d. At least one door in each personnel air lock is properly closed.

    e. The WC&PPS requirements of Specification 3.3.D are being satisfied.

(c) Isolate each affected penetration within 4 hours by use of at least one closed manual valve[3)] or blind flange that meets the design criteria for an isolation valve, or

(d) Be in cold shutdown within the following 36 hours, utilizing normal operating procedures.

B. INTERNAL PRESSURE

If the internal pressure exceeds 2 psig or the internal vacuum exceeds 2.0 psig, the condition shall be corrected or the reactor shut down.

C. CONTAINMENT TEMPERATURE

The reactor shall not be taken above the cold shutdown condition unless the containment ambient temperature is greater than 50°F.

Basis

The Reactor Coolant System conditions of cold shutdown assure that no steam will be formed and hence there would be no pressure buildup in the containment if a Reactor Coolant System rupture were to occur.

The shutdown margins are selected based on the type of activities that are being carried out. The shutdown margin requirement of Specification 3.8.B.2 when the head is off precludes criticality during refueling. When the reactor head is not to be removed, the specified cold shutdown margin of 1% $\Delta k/k$ precludes criticality at cold shutdown conditions.

The containment can withstand an internal vacuum of 2.5 psig. The 2.0 psig vacuum specified as an operating limit avoids any difficulties with motor cooling.

The requirement of a 50°F minimum containment ambient temperature is to assure that the minimum service metal temperature of the containment liner is well above the NDT + 30°F criterion for the liner material[1].

During periods of normal plant operations requiring containment integrity, non-automatic valves that are designated as part of the containment isolation function may be opened either continuously or intermittently depending on requirements of the particular protection, safeguards or essential service systems. The valves which are opened intermittently are under administrative control and are open only for as long as necessary to perform their intended function. These administrative controls consist of stationing a dedicated operator at or near the valve controls who is in continuous communication with the control room. In this way, the penetration can be rapidly isolated when the need for containment isolation is indicated. The dedicated operator is permitted to be stationed nearby, so as to minimize the radiation exposure associated with the compensating action. Transit time to the valve will remain less than two minutes. For those valves that are remote-manually operated from the control room, the dedicated operator administrative control is clarified to be the normally stationed control room operator, since this operator is continuously available to isolate the valve from the control room. An exception to these administrative controls is provided for valve 732 when the RHR system is operating in RHR Cooling mode. Valve 732 is the RHR pumps' suction line isolation valve that is continuously open during RHR cooling when the RCS temperature is < 350°F. If containment isolation is required, valve 732 is shut in accordance with administrative controls to realign the RHR system for safety injection.

In all cases, however, those containment isolation valves that are not required to be opened post-accident are closed during the post-accident period in accordance with plant procedures and consistent with requirements of the related protection, safeguards, or essential service systems.

Reference

(1) UFSAR Section 5.1.1.1
(2) UFSAR Section 5.2

C. AIR LOCK TESTS

1. The containment air locks shall be tested at a minimum pressure of 47 psig. The test shall be performed in accordance with 10 CFR 50 Appendix J, Option B, as modified by approved exemptions and in accordance with guidelines contained in Regulatory Guide 1.163, dated September 1995. The acceptance criteria is included in Specification 4.4.D.2.a.

2. Whenever containment integrity is required, verification shall be made of proper repressurization to at least 47 psig of the double-gasket air lock door seal upon closing an air lock door.

D. CONTAINMENT ISOLATION VALVES

1. Tests and Frequency

   a. Containment isolation valves shall be tested for operability in accordance with 10 CFR 50 Appendix J, Option B, as modified by approved exemptions and in accordance with guidelines contained in Regulatory Guide 1.163, dated September 1995.

   b. Containment Isolation valves which are pressurized by the Weld Channel and Containment Penetration Pressurization System are leakage tested as part of the Sensitive Leakage Rate Test included in Specification 4.4.B.

   c. Containment Isolation valves which are pressurized by the Isolation Valve Seal Water System shall be tested at every refueling but in no case at intervals greater than a Refueling Interval (R##), as part of an overall Isolation Valve Seal Water System Test.

2. Acceptance Criteria

   a. The combined leakage rate for the following shall be less than 0.6 L_a: Containment isolation valves subject to gas or nitrogen pressurization testing, air lock testing as specified in Specification 4.4.C.1, portions of the sensitive leakage rate test described in

Specification 4.4.B.1 which pertain to containment penetrations and double-gasketed seals.

b. The leakage rate into containment for the isolation valves sealed with the service water system shall not exceed 0.36 gpm per fan cooler.

c. The leakage rate for the Isolation Valve Seal Water System shall not exceed 14,700 cc/hr.

E. CONTAINMENT MODIFICATIONS

Any major modification or replacement of components of the containment performed after the initial pre-operational leakage rate test shall be followed by either an integrated leakage rate test or a local leak detection test and shall meet the appropriate acceptance criteria of Specifications 4.4.A.2, 4.4.B.2, or 4.4.D.2. Modifications or replacements performed directly prior to the conduct of an integrated leakage rate test shall not require a separate test.

F. REPORT OF TEST RESULTS

A post-outage report shall be prepared presenting results of the previous cycle's Type B and Type C tests, and Type A, Type B, and Type C tests, if performed during that outage. The technical contents of the report are generally described in ANSI/ANS 56.8-1994, and will be available on-site for NRC review. The report shall also show that the applicable performance criteria are met and serves as a record that continuing performance is acceptable.

G. VISUAL INSPECTION

A detailed visual examination of the accessible interior and exterior surfaces of the containment structure and its components shall be performed at each Refueling Interval (R##) and prior to any integrated leak test to uncover any evidence of deterioration which may affect either the containment structural integrity or leak-tightness. The discovery of any significant deterioration shall be accompanied by corrective actions in accordance with acceptable procedures, non-destructive tests and inspections, and local testing where practical, prior to the conduct of any integrated leak test. Such repairs shall be

seals and spaces between certain containment isolation valves and personnel door locks. A leak would be expected to build up slowly and would, therefore, be noted before design limits are exceeded. Remedial action can be taken before the limit is reached.

During normal plant operation, containment personnel lock door seals are continuously pressurized after each closure by the Weld Channel and Penetration Pressurization System. Whenever containment integrity is required, verification is made that seals repressurize properly upon closure of an air lock door.

A full pressure test of the air lock will be periodically performed to detect any unanticipated leakage.

The containment isolation valve leakage and sensitive leakage rate measurements obtained periodically, periodic inspection of accessible portions of the containment wall to detect possible damage to the liner plates, combined with the leakage monitoring afforded by the Weld Channel and Penetration Pressurization System[(4)] and IVSWS[(5)], provide assurance that the containment leakage is within design limits.

The testing of containment isolation valves, either individually or in groups, utilizes the WC & PPS[(4)] or IVSWS[(5)] where appropriate and is in accordance with the requirements of Type C tests in 10 CFR 50 Appendix J, Option B, as modified by approved exemptions and in accordance with guidelines contained in Regulatory Guide 1.163 dated September 1995. The specified test pressures are ≥ the peak calculated accident pressure. Sufficient water is available in the Isolation Valve Seal Water System, Primary Water System, Service Water System, Residual Heat Removal System, and the City Water System to assure a sealing function for at least 30 days. The leakage limit for the Isolation Valve Seal Water System is consistent with the design capacity of the Isolation Valve Seal Water supply tank.

The acceptance criterion of 0.6 L_a for the combined leakage of isolation valves subject to gas or nitrogen pressurization, the air lock, containment penetrations and double-gasketed seals is consistent with 10 CFR 50 Appendix J, Option B, as modified by approved exemptions and in accordance with guidelines contained in Regulatory Guide 1.163, dated September 1995.

The 350 psig test pressure, achieved either by normal Residual Heat Removal System operation or hydrostatic testing, gives an adequate margin over the highest pressure within the system after a design basis accident. Similarly, the hydrostatic test pressure for the containment sump return line of 100 psig gives an adequate margin over the highest pressure within the line after a design basis accident. A recirculation system leakage of 2 gal./hr. will limit offsite exposures due to leakage to insignificant levels relative to those calculated for leakage directly from the containment in the design basis accident.