United States Nuclear Regulatory Commission
April 4, 1996

Proposed Change 184

Marked-Up Technical Specification Pages

3.7 LIMITING CONDITIONS FOR OPERATION

ΔP is reduced to <1.7) during required operability testing of the HPCI system pump, the RCIC system pump, the drywell-suppression chamber vacuum breakers, and the suppression chamber-reactor building vacuum breakers, and SGTS testing.

d. If the specifications of 3.7.A.9.a cannot be met, and the differential pressure cannot be restored within the subsequent six (6) hour period, an orderly shutdown shall be initiated and the reactor shall be in a Hot Shutdown condition in six (6) hours and a Cold Shutdown condition in the following eighteen (18) hours.

B. <u>Standby Gas Treatment System</u>

1. a. Except as specified in Specification 3.7.B.3.a below, whenever the reactor is in Run Mode or Startup Mode [or Hot Shutdown Condition] both circuits of the Standby Gas Treatment System shall be operable at all times when secondary containment integrity is required.

b. Except as specified in Specification 3.7.B.3.b below, whenever the reactor is in Refuel Mode, [or Cold Shutdown Condition] both circuits of the Standby Gas

4.7 SURVEILLANCE REQUIREMENTS

B. <u>Standby Gas Treatment System</u>

1. At least once per operating cycle, not to exceed 18 months, the following conditions shall be demonstrated.

a. Pressure drop across the combined HEPA and charcoal filter banks is less than 6 inches of water at 1500 cfm ±10%.

b. Inlet heater input is at least 9 kW.

3.7 LIMITING CONDITIONS FOR OPERATION

C. Secondary Containment System

1. Integrity of the secondary containment system shall be maintained during all modes of plant operation except when all of the following conditions are met:

   a. The reactor is subcritical and Specification 3.3.A is met and

   b. The reactor water temperature is below 212°F and the reactor coolant system is vented.

   c. No activity is being performed which can reduce the shutdown margin below that specified in Specification 3.3.A.

   d. The fuel cask or irradiated fuel is not being moved in the Reactor Building.

Insert 3.7.C.1 through 3.7.C.4

4.7 SURVEILLANCE REQUIREMENTS

C. Secondary Containment System

1. Surveillance of secondary containment shall be performed as follows:

   a. A preoperational secondary containment capability test shall be conducted after isolating the Reactor Building and placing either Standby Gas Treatment System filter train in operation. Such tests shall demonstrate the capability to maintain a 0.15 inch of water vacuum under calm wind (2 < u < 5 mph) condition with a filter train flow rate of not more than 1500 cfm.

   b. Additional tests shall be performed during the first operating cycle under an adequate number of different environmental wind conditions to enable valid extrapolation of the test results.

   c. Secondary containment capability to maintain a 0.15 inch of water vacuum under calm wind (2<ū<5 mph) conditions with a filter train flow rate of not more than 1,500 cfm, shall be demonstrated at least quarterly and at each refueling outage prior to refueling.

Insert SR 4.7.C.1.d

3.7 LIMITING CONDITIONS FOR OPERATION

1. Secondary Containment Integrity shall be maintained during the following Modes or conditions:

   a. Whenever the reactor is in the Run Mode, Startup Mode, or Hot Shutdown condition; or

   b. During movement of irradiated fuel assemblies or the fuel cask in secondary containment; or

   c. During Alteration of the Reactor Core; or

   d. During operations with the potential for draining the reactor vessel.

2. With Secondary Containment Integrity not maintained with the reactor in the Run Mode, Startup Mode, or Hot Shutdown condition, restore Secondary Containment Integrity within 4 hours.

3. If Specification 3.7.C.2 cannot be met, place the reactor in the Hot Shutdown condition within 12 hours and in the Cold Shutdown condition within the following 24 hours.

4. With Secondary Containment Integrity not maintained during movement of irradiated fuel assemblies or the fuel cask in secondary containment, during Alteration of the Reactor Core, or during operations with the potential for draining the reactor vessel, immediately perform the following actions:

   a. Suspend movement of irradiated fuel assemblies and the fuel cask in secondary containment; and

   b. Suspend Alteration of the Reactor Core; and

   c. Initiate action to suspend operations with the potential for draining the reactor vessel.

new

4.7 SURVEILLANCE REQUIREMENTS

d. Operability testing of the Reactor Building Automatic Ventilation System isolation valves shall be performed in accordance with Specification 4.6.E.

2. Intentionally blank.

3. Intentionally blank.

4. Intentionally blank.

new

3.7 LIMITING CONDITIONS FOR OPERATION

~~7.~~ 5. Core spray and LPCI pump lower compartment door openings shall be closed at all times except during passage or when reactor coolant temperature is less than 212°F.

D. <u>Primary Containment Isolation Valves</u>

1. During reactor power operating conditions all isolation valves listed in Table 4.7.2 and all instrument line flow check valves shall be operable except as specified in Specification 3.7.D.2.

4.7 SURVEILLANCE REQUIREMENTS

~~7.~~ 5. The core spray and LPCI lower compartment openings shall be checked closed daily.

D. <u>Primary Containment Isolation Valves</u>

1. Surveillance of the primary containment isolation valves should be performed as follows:

   a. The operable isolation valves that are power operated and automatically initiated shall be tested for automatic initiation and the closure times specified in Table 4.7.2 at least once per operating cycle.

   b. Operability testing of the primary containment isolation valves shall be performed in accordance with Specification 4.6.E.

   c. At least once per quarter, with the reactor power less than 75 percent of rated, trip all main steam isolation valves (one at a time) and verify closure time.

   d. At least twice per week, the main steam line isolation valves shall be exercised by partial closure and subsequent reopening.

BASES: 3.7 (Cont'd)

The vacuum relief system from the pressure suppression chamber to Reactor Building consists of two 100% vacuum relief breakers (2 parallel sets of 2 valves in series). Operation of either system will maintain the pressure differential less than 2 psig; the external design pressure is 2 psig. With one vacuum breaker out of service there is no immediate threat to accident mitigation or primary containment and, therefore, reactor operation can be continued for 7 days while repairs are being made.

The capacity of the ten (10) drywell vacuum relief valves is sized to limit the pressure differential between the suppression chamber and drywell during post-accident drywell cooling operations to the design limit of 2 psig. They are sized on the basis of the Bodega Bay pressure suppression tests. The ASME Boiler and Pressure Vessel Code, Section III, Subsection B, for this vessel allows eight (8) operable valves, therefore, with two (2) valves secured, containment integrity is not impaired.

Each drywell-suppression chamber vacuum breaker is fitted with a redundant pair of limit switches to provide fail-safe signals to panel mounted indicators in the Reactor Building and alarms in the Control Room when the disks are open more than 0.050" at all points along the seal surface of the disk. These switches are capable of transmitting the disk closed to open signal with 0.01" movement of the switch plunger. Continued reactor operation with failed components is justified because of the redundance of components and circuits and, most importantly, the accessibility of the valve lever arm and position reference external to the valve. The fail safe feature of the alarm circuits assures operator attention if a line fault occurs.

The requirement to inert the containment is based on the recommendation of the Advisory Committee on Reactor Safeguards. This recommendation, in turn, is based on the assumption that several percent of the zirconium in the core will undergo a reaction with steam during the loss-of-coolant accident. This reaction would release sufficient hydrogen to result in a flammable concentration in the primary containment building. The oxygen concentration is therefore kept below 4% to minimize the possibility of hydrogen combustion.

General Electric has estimated that less than 0.1% of the zirconium would react with steam following a loss-of-coolant due to operation of emergency core cooling equipment. This quantity of zirconium would not liberate enough hydrogen to form a combustible mixture.

B. and C. Standby Gas Treatment System and Secondary Containment System

The secondary containment is designed to minimize any ground level release of radioactive materials which might result from a serious accident. The Reactor Building provides secondary containment during reactor operation, when the drywell is sealed and in service; the Reactor Building provides primary containment when the reactor is shutdown and the drywell is open, as during refueling. Because the secondary containment is an integral part of the complete containment system, secondary containment is required at all times that primary containment is required except, however, for initial fuel loading and low power physics testing.

Insert
Bases 3.7.C

INSERT BASES 3.7.C

In the Cold Shutdown condition or the Refuel Mode, the probability and consequences of the LOCA are reduced due to the pressure and temperature limitations in these conditions. Therefore, maintaining Secondary Containment Integrity is not required in the Cold Shutdown condition or the Refuel Mode, except for other situations for which significant releases of radioactive material can be postulated, such as during operations with a potential for draining the reactor vessel, during Alteration of the Reactor Core, or during movement of irradiated fuel assemblies or the fuel cask in the secondary containment.

With the reactor in the Run Mode, the Startup Mode, or the Hot Shutdown condition if Secondary Containment Integrity is not maintained, Secondary Containment Integrity must be restored within 4 hours. The 4 hours provides a period of time to correct the problem that is commensurate with the importance of maintaining secondary containment during the Run Mode, the Startup Mode, and the Hot Shutdown condition. This time period also ensures that the probability of an accident (requiring Secondary Containment Integrity) occurring during periods where Secondary Containment Integrity is not maintained is minimal. If Secondary Containment Integrity cannot be restored within the required time period, the plant must be brought to a Mode or condition in which the LCO does not apply.

Movement of irradiated fuel assemblies or the fuel cask in the secondary containment, Alteration of the Reactor Core, and operations with the potential for draining the reactor vessel can be postulated to cause fission product release to the secondary containment. In such cases, the secondary containment is the only barrier to release of fission products to the environment. Alteration of the Reactor Core and movement of irradiated fuel assemblies and the fuel cask must be immediately suspended if Secondary Containment Integrity is not maintained. Suspension of these activities shall not preclude completing an action that involves moving a component to a safe position. Also, action must be immediately initiated to suspend operations with the potential for draining the reactor vessel to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until operations with the potential for draining the reactor vessel are suspended.

BASES: 4.7 (Cont'd)

At the end of each refueling cycle, a leak rate test shall be performed to verify that significant leakage flow paths do not exist between the drywell and suppression chamber. The drywell pressure will be increased by at least 1 psi with respect to the suppression chamber pressure and held constant. The 2 psig set point will not be exceeded. The subsequent suppression chamber pressure transient (if any) will be monitored with a sensitive pressure guage. If the drywell pressure cannot be increased by 1 psi over the suppression chamber pressure it would be because a significant leakage path exists; in this event the leakage source will be identified and eliminated before power operation is resumed. If the drywell pressure can be increased by 1 psi over the suppression chamber the rate of change of the suppression chamber pressure must not exceed a rate equivalent to the rate of leakage from the drywell through a 1-inch orifice. In the event the rate of change exceeds this value then the source of leakage will be identified and eliminated before power operation is resumed.

The drywell-suppression chamber vacuum breakers are exercised in accordance with Specification 4.6.E and immediately following termination of discharge of steam into the suppression chamber. This monitoring of valve operability is intended to assure that valve operability and position indication system performance does not degrade between refueling inspections. When a vacuum breaker valve is exercised through an opening-closing cycle, the position indicating lights are designed to function as follows:

Full Closed (Closed to ≤0.050" open)	2 White - On
Open (>0.050" open to full open)	2 White - Off

During each refueling outage, two drywell-suppression chamber vacuum breakers will be inspected to assure sealing surfaces and components have not deteriorated. Since valve internals are designed for a 40-year lifetime, an inspection program which cycles through all valves in one-eighth of the design lifetime is extremely conservative.

Experience has shown that a weekly measurement of the oxygen concentration in the primary containment assures adequate surveillance of the primary containment atmosphere.

B. and C. Standby Gas Treatment System and Secondary Containment System

Initiating reactor building isolation and operation of the standby gas treatment system to maintain at least a 0.15 inch of water vacuum within the secondary containment provides an adequate test of the operation of the reactor building isolation valves, leakage tightness of the reactor building, and performance of the standby gas treatment system. Functionally testing of initiating sensors and associated trip channels demonstrates the capability for automatic actuation. Periodic testing gives sufficient confidence of reactor building integrity and standby gas treatment system performance capability.

insert

The testing of reactor building automatic ventilation system isolation valves in accordance with TS 4.6.E, demonstrates the operability of these valves.

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New Technical Specification Pages

3.7 LIMITING CONDITIONS FOR OPERATION

ΔP is reduced to <1.7) during required operability testing of the HPCI system pump, the RCIC system pump, the drywell-suppression chamber vacuum breakers, and the suppression chamber-reactor building vacuum breakers, and SGTS testing.

d. If the specifications of 3.7.A.9.a cannot be met, and the differential pressure cannot be restored within the subsequent six (6) hour period, an orderly shutdown shall be initiated and the reactor shall be in a Hot Shutdown condition in six (6) hours and a Cold Shutdown condition in the following eighteen (18) hours.

B. <u>Standby Gas Treatment System</u>

1. a. Except as specified in Specification 3.7.B.3.a below, whenever the reactor is in Run Mode or Startup Mode or Hot Shutdown condition, both circuits of the Standby Gas Treatment System shall be operable at all times when secondary containment integrity is required.

   b. Except as specified in Specification 3.7.B.3.b below, whenever the reactor is in Refuel Mode or Cold Shutdown condition, both circuits of the Standby Gas

4.7 SURVEILLANCE REQUIREMENTS

B. <u>Standby Gas Treatment System</u>

1. At least once per operating cycle, not to exceed 18 months, the following conditions shall be demonstrated.

   a. Pressure drop across the combined HEPA and charcoal filter banks is less than 6 inches of water at 1500 cfm ±10%.

   b. Inlet heater input is at least 9 kW.

3.7 LIMITING CONDITIONS FOR OPERATION

C. Secondary Containment System

1. Secondary Containment Integrity shall be maintained during the following modes or conditions:

   a. Whenever the reactor is in the Run Mode, Startup Mode, or Hot Shutdown condition; or

   b. During movement of irradiated fuel assemblies or the fuel cask in secondary containment; or

   c. During alteration of the Reactor Core; or

   d. During operations with the potential for draining the reactor vessel.

4.7 SURVEILLANCE REQUIREMENTS

C. Secondary Containment System

1. Surveillance of secondary containment shall be performed as follows:

   a. A preoperational secondary containment capability test shall be conducted after isolating the Reactor Building and placing either Standby Gas Treatment System filter train in operation. Such tests shall demonstrate the capability to maintain a 0.15 inch of water vacuum under calm wind ($2 < u < 5$ mph) condition with a filter train flow rate of not more than 1500 cfm.

   b. Additional tests shall be performed during the first operating cycle under an adequate number of different environmental wind conditions to enable valid extrapolation of the test results.

   c. Secondary containment capability to maintain a 0.15 inch of water vacuum under calm wind ($2<\bar{u}<5$ mph) conditions with a filter train flow rate of not more than 1,500 cfm, shall be demonstrated at least quarterly and at each refueling outage prior to refueling.

3.7 LIMITING CONDITIONS FOR OPERATION	4.7 SURVEILLANCE REQUIREMENTS
	d. Operability testing of the Reactor Building Automatic Ventilation System isolation valves shall be performed in accordance with Specification 4.6.E.
2. With Secondary Containment Integrity not maintained with the reactor in the Run Mode, Startup Mode, or Hot Shutdown condition, restore Secondary Containment Integrity within four (4) hours.	2. Intentionally blank.
3. If Specification 3.7.C.2 cannot be met, place the reactor in the Hot Shutdown condition within 12 hours and in the Cold Shutdown condition within the following 24 hours.	3. Intentionally blank.
4. With Secondary Containment Integrity not maintained during movement of irradiated fuel assemblies or the fuel cask in secondary containment, during alteration of the Reactor Core, or during operations with the potential for draining the reactor vessel, immediately perform the following actions: a. Suspend movement of irradiated fuel assemblies and the fuel cask in secondary containment; and b. Suspend alteration of the Reactor Core; and c. Initiate action to suspend operations with the potential for draining the reactor vessel.	4. Intentionally blank.

3.7 LIMITING CONDITIONS FOR OPERATION

5. Core spray and LPCI pump lower compartment door openings shall be closed at all times except during passage or when reactor coolant temperature is less than 212°F.

D. Primary Containment Isolation Valves

1. During reactor power operating conditions all isolation valves listed in Table 4.7.2 and all instrument line flow check valves shall be operable except as specified in Specification 3.7.D.2.

4.7 SURVEILLANCE REQUIREMENTS

5. The core spray and LPCI lower compartment openings shall be checked closed daily.

D. Primary Containment Isolation Valves

1. Surveillance of the primary containment isolation valves should be performed as follows:

   a. The operable isolation valves that are power operated and automatically initiated shall be tested for automatic initiation and the closure times specified in Table 4.7.2 at least once per operating cycle.

   b. Operability testing of the primary containment isolation valves shall be performed in accordance with Specification 4.6.E.

   c. At least once per quarter, with the reactor power less than 75 percent of rated, trip all main steam isolation valves (one at a time) and verify closure time.

   d. At least twice per week, the main steam line isolation valves shall be exercised by partial closure and subsequent reopening.

BASES: 3.7 (Cont'd)

The vacuum relief system from the pressure suppression chamber to Reactor Building consists of two 100% vacuum relief breakers (2 parallel sets of 2 valves in series). Operation of either system will maintain the pressure differential less than 2 psig; the external design pressure is 2 psig. With one vacuum breaker out of service there is no immediate threat to accident mitigation or primary containment and, therefore, reactor operation can be continued for 7 days while repairs are being made.

The capacity of the ten (10) drywell vacuum relief valves is sized to limit the pressure differential between the suppression chamber and drywell during post-accident drywell cooling operations to the design limit of 2 psig. They are sized on the basis of the Bodega Bay pressure suppression tests. The ASME Boiler and Pressure Vessel Code, Section III, Subsection B, for this vessel allows eight (8) operable valves, therefore, with two (2) valves secured, containment integrity is not impaired.

Each drywell-suppression chamber vacuum breaker is fitted with a redundant pair of limit switches to provide fail-safe signals to panel mounted indicators in the Reactor Building and alarms in the Control Room when the disks are open more than 0.050" at all points along the seal surface of the disk. These switches are capable of transmitting the disk closed to open signal with 0.01" movement of the switch plunger. Continued reactor operation with failed components is justified because of the redundance of components and circuits and, most importantly, the accessibility of the valve lever arm and position reference external to the valve. The fail safe feature of the alarm circuits assures operator attention if a line fault occurs.

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B. and C. Standby Gas Treatment System and Secondary Containment System

The secondary containment is designed to minimize any ground level release of radioactive materials which might result from a serious accident. The Reactor Building provides secondary containment during reactor operation, when the drywell is sealed and in service; the Reactor Building provides primary containment when the reactor is shutdown and the drywell is open, as during refueling. Because the secondary containment is an integral part of the complete containment system, secondary containment is required at all times that primary containment is required except, however, for initial fuel loading and low power physics testing.

In the Cold Shutdown condition or the Refuel Mode, the probability and consequences of the LOCA are reduced due to the pressure and temperature limitations in these conditions. Therefore, maintaining Secondary Containment Integrity is not required in the Cold Shutdown condition or the Refuel Mode, except for other situations for which

BASES: 3.7 (Cont'd)

significant releases of radioactive material can be postulated, such as during operations with a potential for draining the reactor vessel, during alteration of the Reactor Core, or during movement of irradiated fuel assemblies or the fuel cask in the secondary containment.

With the reactor in the Run Mode, the Startup Mode, or the Hot Shutdown condition, if Secondary Containment Integrity is not maintained, Secondary Containment Integrity must be restored within 4 hours. The 4 hours provides a period of time to correct the problem that is commensurate with the importance of maintaining secondary containment during the Run Mode, the Startup Mode, and the Hot Shutdown condition. This time period also ensures that the probability of an accident (requiring Secondary Containment Integrity) occurring during periods where Secondary Containment Integrity is not maintained, is minimal. If Secondary Containment Integrity cannot be restored within the required time period, the plant must be brought to a mode or condition in which the LCO does not apply.

Movement of irradiated fuel assemblies or the fuel cask in the secondary containment, alteration of the Reactor Core, and operations with the potential for draining the reactor vessel can be postulated to cause fission product release to the secondary containment. In such cases, the secondary containment is the only barrier to release of fission products to the environment. Alteration of the Reactor Core and movement of irradiated fuel assemblies and the fuel cask must be immediately suspended if Secondary Containment Integrity is not maintained. Suspension of these activities shall not preclude completing an action that involves moving a component to a safe position. Also, action must be immediately initiated to suspend operations with the potential for draining the reactor vessel to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until operations with the potential for draining the reactor vessel are suspended.

BASES: 4.7 (Cont'd)

At the end of each refueling cycle, a leak rate test shall be performed to verify that significant leakage flow paths do not exist between the drywell and suppression chamber. The drywell pressure will be increased by at least 1 psi with respect to the suppression chamber pressure and held constant. The 2 psig set point will not be exceeded. The subsequent suppression chamber pressure transient (if any) will be monitored with a sensitive pressure gauge. If the drywell pressure cannot be increased by 1 psi over the suppression chamber pressure it would be because a significant leakage path exists; in this event the leakage source will be identified and eliminated before power operation is resumed. If the drywell pressure can be increased by 1 psi over the suppression chamber the rate of change of the suppression chamber pressure must not exceed a rate equivalent to the rate of leakage from the drywell through a 1-inch orifice. In the event the rate of change exceeds this value then the source of leakage will be identified and eliminated before power operation is resumed.

The drywell-suppression chamber vacuum breakers are exercised in accordance with Specification 4.6.E and immediately following termination of discharge of steam into the suppression chamber. This monitoring of valve operability is intended to assure that valve operability and position indication system performance does not degrade between refueling inspections. When a vacuum breaker valve is exercised through an opening-closing cycle, the position indicating lights are designed to function as follows:

Full Closed (Closed to ≤0.050" open)	2 White - On
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During each refueling outage, two drywell-suppression chamber vacuum breakers will be inspected to assure sealing surfaces and components have not deteriorated. Since valve internals are designed for a 40-year lifetime, an inspection program which cycles through all valves in one-eighth of the design lifetime is extremely conservative.

Experience has shown that a weekly measurement of the oxygen concentration in the primary containment assures adequate surveillance of the primary containment atmosphere.

B. and C. Standby Gas Treatment System and Secondary Containment System

Initiating reactor building isolation and operation of the standby gas treatment system to maintain at least a 0.15 inch of water vacuum within the secondary containment provides an adequate test of the operation of the reactor building isolation valves, leakage tightness of the reactor building, and performance of the standby gas treatment system. The testing of reactor building automatic ventilation system isolation valves in accordance with Technical Specification 4.6.E demonstrates the operability of these valves. In addition, functional testing of initiating sensors and associated trip channels demonstrates the capability for automatic actuation. Periodic testing gives sufficient confidence of reactor building integrity and standby gas treatment system performance capability.