3.7 LIMITING CONDITIONS FOR OPERATION

3.7 CONTAINMENT SYSTEMS

Applicability:

Applies to the operating status of the primary and secondary containment systems.

Objective:

To assure the integrity of the primary and secondary containment systems.

Specification:

A. Primary Containment

1. The level from the bottom of the torus and temperature of the water in the torus shall be maintained within the following limits whenever the reactor is critical or whenever the reactor coolant temperature is greater than 212°F and irradiated fuel is in the reactor vessel:

   a. Maximum level of 14.00 feet.

   b. Minimum level of 13.88 feet.

   The torus water level may be outside the above limits for a maximum of four (4) hours as a result of required operability testing of HPCI, RCIC, RHR, CS, and the Drywell - Torus Vacuum Relief System.

   c. Maximum water temperature

      (1) During normal power operation maximum water temperature shall be 95°F.

4.7 SURVEILLANCE REQUIREMENTS

4.7 CONTAINMENT SYSTEMS

Applicability:

Applies to the primary and secondary containment integrity.

Objective:

To verify the integrity of the primary and secondary containment systems.

Specification:

A. Primary Containment

1. The torus water level and temperature shall be monitored as specified in Table 4.2-8.

   The accessible interior surfaces of the drywell and above the water line of the torus shall be inspected once per 24 months for evidence of deterioration.

   Whenever there is indication of relief valve operation or testing which adds heat to the suppression pool, the pool temperature shall be continuously recorded until the heat addition is terminated. The operator will verify that average temperature is within applicable limits every 5 minutes. In lieu of continuous recording, the operator shall log the temperature every 5 minutes.

   Whenever there is indication of relief valve operation with the temperature of the suppression pool reaching 160°F or more and the primary coolant system pressure greater than 200 psig, an external visual examination of the torus shall be conducted before resuming power operation.

3.7 (cont'd)

breaker is sooner made operable, provided that the repair procedure does not violate primary containment integrity.

5. Pressure Suppression Chamber - Drywell Vacuum Breakers

a. When primary containment integrity is required, all drywell suppression chamber vacuum breakers shall be operable and positioned in the fully closed position except during testing and as specified in 3.7.A.5.b below.

b. One drywell suppression chamber vacuum breaker may be non-fully closed so long as it is determined to be not more than 1° open as indicated by the position lights.

c. One drywell suppression chamber vacuum breaker may be determined to be inoperable for opening.

d. Deleted

4.7 (cont'd)

5. Pressure Suppression Chamber - Drywell Vacuum Breakers

a. Each drywell suppression chamber vacuum breaker shall be exercised through an opening - closing cycle monthly.

b When it is determined that one vacuum breaker is inoperable for fully closing when operability is required, the operable breakers shall be exercised immediately, and every 15 days thereafter until the inoperable valve has been returned to normal service.

c. Once per 24 months, each vacuum breaker valve shall be visually inspected to insure proper maintenance and operation.

d. A leak test of the drywell to suppression chamber structure shall be conducted once per 24 months; the acceptable leak rate is $\leq$0.25 in. water/min, over a 10 min period, with the drywell at 1 psid.

3.7 (cont'd)

e. Leakage between the drywell and suppression chamber shall not exceed a rate of 71 scfm as monitored via the suppression chamber 10 min pressure transient of 0.25 in. water/min.

f. The self actuated vacuum breakers shall open when subjected to a force equivalent to 0.5 psid acting on the valve disc.

g. From and after the date that one of the pressure suppression chamber/drywell vacuum breakers is made or found to be inoperable for any reason, the vacuum breaker shall be locked closed and reactor operation is permissible only during the succeeding seven days unless such vacuum breaker is sooner made operable, provided that the repair procedure does not violate primary containment integrity.

4.7 (cont'd)

e. Not applicable

f. Not applicable

g. Once per 24 months, each vacuum breaker shall be tested to determine that the force required to open the vacuum breaker does not exceed the force specified in Specification 3.7.A.5.f and each vacuum breaker shall be inspected and verified to meet design requirements.

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3.7 (cont'd)

B. Standby Gas Treatment System

1. Except as specified in 3.7.B.2 below both circuits of the Standby Gas Treatment System shall be operable at all times when secondary containment integrity is required.

4.7 (cont'd)

B. Standby Gas Treatment System

1. Standby Gas Treatment System surveillance shall be performed as indicated below:

   a. Once per 24 months, it shall be demonstrated that:

      (1) Pressure drop across the combined high-efficiency and charcoal filters is less than 5.7 in. of water at 6,000 scfm, and

      (2) Each 39kW heater shall dissipate greater than 29kW of electric power as calculated by the following expression:

$$P = \sqrt{3}EI$$

where:
P = Dissipated Electrical Power;
E = Measured line-to-line voltage in volts (RMS);
I = Average measured phase current in amperes (RMS).

4.7 (cont'd)

b. At least once during each scheduled secondary containment leak rate test, whenever a filter is changed, whenever work is performed that could affect the filter system efficiency, and at intervals not to exceed six months between refueling outages, it shall be demonstrated that:

(1.) The removal efficiency of the particulate filters is not less than 99 percent based on a DOP test per ANSI N101.1-1972 para. 4.1.

(2.) The removal efficiency of each of the charcoal filters is not less than 99 percent based on a Freon test.

c. At least once each yr, removable charcoal cartridges shall be removed and absorption capability shall be demonstrated.

d. Once per 24 months, automatic initiation of each branch of the Standby Gas Treatment System shall be demonstrated.

3.7 (cont'd)

2. From and after the date that one circuit of the Standby Gas Treatment System is made or found to be inoperable for any reason, the following would apply:

   a. If in Start-up/Hot Standby, Run or Hot Shutdown mode, reactor operation or irradiated fuel handling is permissible only during the succeeding 7 days unless such circuit is sooner made operable, provided that during such 7 days all active components of the other Standby Gas Treatment Circuit shall be operable.

   b. If in Refuel or Cold Shutdown mode, reactor operation or irradiated fuel handling is permissible only during the succeeding 31 days unless such circuit is sooner made operable, provided that during such 31 days all active components of the other Standby Gas Treatment Circuit shall be operable.

3. If Specifications 3.7.B.1 and 3.7.B.2 are not met, the reactor shall be placed in the cold condition and irradiated fuel handling operations and operations that could reduce the shutdown margin shall be prohibited.

4.7 (cont'd)

e. Once per 24 months, manual operability of the bypass valve for filter cooling shall be demonstrated.

f. Standby Gas Treatment System Instrumentation Calibration:

differential pressure switches	Once/operating Cycle

2. When one circuit of the Standby Gas Treatment System becomes inoperable, the operable circuit shall be verified to be operable immediately and daily thereafter.

3. Intentionally Blank

3.7 (cont'd)

D. Primary Containment Isolation Valves

1. Whenever primary containment integrity is required per 3.7.A.2, containment isolation valves and all instrument line excess flow check valves shall be operable, except as specified in 3.7.D.2. The containment vent and purge valves shall be limited to opening angles less than or equal to that specified below:

Valve Number	Maximum Opening Angle
27AOV-111	40°
27AOV-112	40°
27AOV-113	40°
27AOV-114	50°
27AOV-115	50°
27AOV-116	50°
27AOV-117	50°
27AOV-118	50°

4.7 (cont'd)

c. Secondary containment capability to maintain a 1/4 in. of water vacuum under calm wind conditions with a filter train flow rate of not more than 6,000 cfm, shall be demonstrated once per 24 months prior to refueling.

D. Primary Containment Isolation Valves

1. The primary containment isolation valves surveillance shall be performed as follows:

a. Once per 24 months, the operable isolation valves that are power operated and automatically initiated shall be tested for simulated automatic initiation and for closure time.

b. At least once per operating cycle, the instrument line excess flow check valves shall be tested for proper operation.

c. At least once per quarter:

(1.) All normally open power-operated isolation valves (except for the main steam line and Reactor Building Closed Loop Cooling Water System (RBCLCWS) power-operated isolation valves shall be fully closed and reopened.

4.7 BASES (cont'd)

building isolation valves, leak-tightness of the reactor building and performance of the Standby Gas Treatment System. Functionally testing the initiating sensors and associated trip channels demonstrates the capability for automatic actuation. Performing these tests prior to refueling will demonstrate secondary containment capability prior to the time the primary containment is opened for refueling. Periodic testing gives sufficient confidence of reactor building integrity and Standby Gas Treatment System performance capability.

The test frequencies are adequate to detect equipment deterioration prior to significant defects, but the tests are not frequent enough to load the filters, thus reducing their reserve capacity too quickly. That the testing frequency is adequate to detect deterioration was demonstrated by the tests which showed no loss of filter efficiency after 2 yr. of operation in the rugged shipboard environment on the NS Savannah (ORNL 3726). Pressure drop tests across filter sections are performed to detect gross plugging or leak paths through the filter media. Considering the relatively short time that the fans may be run for test purposes, plugging is unlikely, and the test interval of once per 24 months is reasonable. Duct heater tests will be conducted once per 24 months. Considering the simplicity of the heating circuit, the test frequency is sufficient.

The in place testing of charcoal filters is performed using Freon or equivalent, which is injected into the system upstream of the charcoal filters. Measurements of the Freon concentration upstream and downstream of the charcoal filters is made. The ratio of the inlet and outlet concentrations gives an overall indication of the leak tightness of the system. Although this is basically a leak test, since the filters have charcoal of known efficiency and holding capacity for elemental iodine and/or methyl iodine, the test also gives an indication of the relative efficiency of the installed system.

High-efficiency particulate filters are installed to minimize potential release of particulates to the environment. An efficiency of 90 percent is adequate to retain particulates that may be released to the reactor building following an accident. This will be demonstrated by in-place testing with DOP as testing medium

4.7 BASES (cont'd)

The test interval for filter efficiency was selected to minimize plugging of the filters. In addition, retention capacity in terms of milligrams of iodine per gram of charcoal will be demonstrated. This will be done by testing the charcoal once a year, unless filter efficiency seriously deteriorates. Since shelf lives greater than 5 yr. have been demonstrated, the test interval is reasonable.

D. Primary Containment Isolation Valves

The large pipes comprising a portion of the Reactor Coolant System, whose failure could result in uncovering the reactor core, are supplied with automatic isolation valves (except those lines needed for Emergency Core Cooling Systems operation or containment cooling). Valve closure times are adequate to prevent loss of more coolant from the circumferential rupture of any of these lines outside the containment than from a steam line rupture. Therefore, isolation valve closure times are sufficient to prevent uncovering the core.

In order to assure that the doses that may result from a steam line break do not exceed the 10CFR100 guidelines, it is necessary that no fuel rod perforation resulting from the accident occur prior to closure of the main steam line isolation valves. Analyses indicate that fuel rod cladding perforations would be avoided for main steam valve closure times, including instrument delay, as long as 10.5 sec.

For Reactor Coolant System temperatures less than 212°F, the containment could not become pressurized due to a loss-of-coolant accident. The 212°F limit is based on preventing pressurization of the reactor building and rupture of the blowout panels.

The primary containment isolation valves are highly reliable, have low service requirement, and most are normally closed. Power operated primary containment isolation valves that can be cycled during normal plant operations are cycled periodically per the ASME Section XI Inservice Testing Program. Valves that can not be cycled during normal plant operations are tested once every 24 months. The initiating sensors and associated trip channels are periodically checked to demonstrate proper response. This combination of testing adequately verifies operability of power operated and automatically initiated primary containment isolation valves.

4.7 BASES (cont'd)

The main steam line isolation valves are functionally tested on a more frequent interval to establish a high degree of reliability.

The primary containment is penetrated by several small diameter instrument lines connected to the reactor coolant system. Each instrument line contains a 0.25 in. restricting orifice inside the primary containment and an excess flow check valve outside the primary containment.

The RBCLCWS valves are excluded from the quarterly surveillance requirements because closure of these valves will eliminate the coolant flow to the drywell air and recirculation pump-motor coolers. Without cooling water, the drywell air and equipment temperature will increase and may cause damage to the equipment during normal plant operations. Therefore, testing of these valves would only be conducted in the cold condition.

A list of containment isolation valves, including a brief description of each valve is included in Section 7.3 of the updated FSAR.

ATTACHMENT II to JPN-95-046

Safety Evaluation
For Proposed Changes to Technical Specification
Containment Systems Surveillance Test Intervals to
Accommodate 24-Month Operating Cycles (JPTS-95-001D)

New York Power Authority

JAMES A. FITZPATRICK NUCLEAR POWER PLANT
Docket No. 50-333
DPR-59

I. DESCRIPTION OF THE PROPOSED CHANGES

1. Page 165, Specification 4.7.A.1, change the inspection of the drywell accessible interior surfaces from "each operating cycle" to "once per 24 months." The revised specification reads:

   "The accessible interior surfaces of the drywell and above the water line of the torus shall be inspected once per 24 months for evidence of deterioration."

2. Page 178, Specification 4.7.A.5.c, change the visual inspection of the vacuum breaker valves from "each operating cycle" to "per 24 months." The revised specification reads:

   "c. Once per 24 months, each vacuum breaker valve shall be visually inspected to insure proper maintenance and operation."

3. Page 178, Specification 4.7.A.5.d, change the surveillance interval of the leak test of the drywell to suppression chamber structure from "once per operating cycle" to "once per 24 months." The revised specification reads:

   "d. A leak test of the drywell to suppression chamber structure shall be conducted once per 24 months; the acceptable leak rate is $\leq$0.25 in. water/min, over a 10 min period, with the drywell at 1 psid."

4. Page 179, Specification 4.7.A.5.g, change the testing interval of the vacuum breaker valves from "during each refueling outage" to "Once per 24 months." The revised specification reads:

   "g. Once per 24 months, each vacuum breaker shall be tested to determine that the force required to open the vacuum breaker does not exceed the force specified in Specification 3.7.A.5.f and each vacuum breaker shall be inspected and verified to meet design requirements."

5. Page 181, Specification 4.7.B.1.a, change the Standby Gas Treatment System surveillance requirements for filter pressure drop and heater power dissipation from "once per operating cycle" to "once per 24 months." The revised specification reads:

   "a. Once per 24 months, it shall be demonstrated that:"

6. Page 182, Specification 4.7.B.1.d, change the Standby Gas Treatment System automatic initiation surveillance from "once each operating cycle" to "once per 24 months." The revised specification reads:

"d. Once per 24 months, automatic initiation of each branch of the Standby Gas Treatment System shall be demonstrated."

7. Page 183, Specification 4.7.B.1.e, change the Standby Gas Treatment System manual operability of the bypass valve for filter cooling surveillance from "once per operating cycle" to "once per 24 months." The revised specification reads:

"e. Once per 24 months, manual operability of the bypass valve for filter cooling shall be demonstrated."

8. Page 185, Specification 4.7.C.1.c, change this surveillance interval from "at each refueling outage" to "once per 24 months." The revised specification reads:

"c. Secondary containment capability to maintain a 1/4 in. of water vacuum under calm wind conditions with a filter train flow rate of not more than 6,000 cfm, shall be demonstrated once per 24 months prior to refueling."

9. Page 185, Specification 4.7.D.1.a, change the Primary Containment Isolation Valves simulated automatic initiation and closure time test from "once per operating cycle" to "once per 24 months." The revised specification reads:

"a. Once per 24 months, the operable isolation valves that are power operated and automatically initiated shall be tested for simulated automatic initiation and for closure time."

10. Page 185, Specification 4.7.D.1.b, delete footnote indicated by "*" in Specification 4.7.D.1.b since the conditions allowing a test extension have expired.

11. Bases page 195, second paragraph fourth sentence, change "once per operating cycle" to "once per 24 months." The revised bases read:

"Considering the relatively short time that the fans may be run for test purposes, plugging is unlikely, and the test interval of once per 24 months is reasonable."

13. Bases page 195, second paragraph fifth sentence, change "once during each operating cycle" to "once per 24 months." The revised bases reads:

"Duct heater tests will be conducted once per 24 months."

14. Bases page 196, first column first line, move the words "by in-place testing with DOP as testing medium." to second column last sentence on page 195 to make the bases easier to read. This is an editorial change only and does not change the wording of the Technical Specification Bases.

15. Bases page 196, second column last paragraph, and Bases page 197, first line, delete current wording and replace with the following:

"Power operated primary containment isolation valves that can be cycled during normal plant operations are cycled periodically per the ASME Section XI Inservice Testing Program. Valves that can not be cycled during normal plant operations are tested once every 24 months. The initiating sensors and associated trip channels are periodically checked to demonstrate proper response. This combination of testing adequately verifies operability of power operated and automatically initiated primary containment isolation valves."

II. PURPOSE OF THE PROPOSED CHANGES

This application for amendment to the James A. FitzPatrick Nuclear Power Plant Technical Specifications proposes to extend the surveillance test intervals for the Containment Systems to accommodate 24 month operating cycles. These changes will eliminate the need to shut the plant down mid-cycle to conduct these surveillances. Extended surveillance intervals are identified in the proposed Technical Specifications as being performed "once per 24 months." These changes follow the guidance provided by Generic Letter 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate 24-Month Fuel Cycle," (Reference 1).

Containment system surveillance tests conducted once per operating cycle were evaluated to confirm that the surveillance intervals could be safely extended. The evaluation (Reference 2) included a detailed study of containment system surveillance history. Surveillance test data was analyzed for components affected by the extended operating cycle. The evaluation concluded that the identified containment systems surveillance tests can be safely extended to accommodate a 24 month operating cycle.

Surveillance intervals associated with 10 CFR 50 Appendix J required primary containment leakage rate testing are not being extended at this time. These requirements will be addressed in an upcoming amendment application to adopt the new Appendix J Option B leak rate testing requirements. The Standby Gas Treatment (SBGT) system instrument calibrations required by SR 4.7.B.1.f and the Excess Flow Check Valve testing required by SR 4.7.D.1.b are not addressed in this amendment application. They will be addressed in the upcoming 24 month cycle Instrumentation systems amendment request.

Containment Systems Objective and Description
The design objective of the Containment systems is to provide the capability, in conjunction with other engineered safeguards, to limit the release of radioactive materials so that off-site doses from a postulated design basis accident (DBA) are below the guideline values of 10 CFR 100.

The containment systems at the FitzPatrick Plant consist of the Primary and Secondary Containment and their support systems. The Primary Containment system consists of a drywell, pressure suppression chamber (torus) which stores a large volume of water (suppression pool), the connecting vent system between the drywell and suppression pool, isolation valves, vacuum relief system , and provisions for containment cooling. The Secondary Containment totally encloses the Primary Containment, the refueling and reactor servicing areas, the new and spent fuel storage facilities, and other reactor auxiliary systems. The Secondary Containment serves as the containment during reactor refueling and maintenance operations when the primary containment is open, and as an additional barrier when the primary containment is functional. The Secondary Containment consists of the Reactor Building, the Standby Gas Treatment (SGT) system, the main stack and the Reactor Building Isolation and Control System.

The SGT system provides the secondary containment with a negative pressure to control reactor building leakage, and provides filtration for removal of particulates and iodines prior to release through the main stack. The system consists of two redundant full capacity air filtration trains. Each train consists of a demister, prefilter, an electric heater, a high efficiency particulate absolute (HEPA) filter, an activated charcoal adsorber and a HEPA after filter. With the reactor building isolated, each fan has the capacity necessary to reduce and maintain the reactor building at a minimum sub-atmospheric pressure of 0.25 inches of water.

III. SAFETY IMPLICATION OF THE PROPOSED CHANGES

Once per operating cycle surveillance requirements (SRs) for the Containment systems are provided in Technical Specifications 4.7.A.1, 4.7.A.2, 4.7.A.5, 4.7.B.1, 4.7.C.1 and 4.7.D.1. The purpose of these tests and the potential safety implications of the extended surveillance interval are discussed below.

Primary Containment Interior Inspection (SR 4.7.A.1)
This surveillance requires a once per operating cycle inspection of the primary containment surfaces for signs of deterioration. Specifically, the accessible interior surfaces of the drywell and above the water line of the torus are inspected for evidence of deterioration such as scaling, rusting, and/or paint chipping which could affect the structural integrity of the primary containment. During plant operation all surfaces required to be inspected are inaccessible. Therefore, a plant shutdown is required to perform this surveillance.

The surveillance interval of once per operating cycle is based on the accessibility to the containment interior, not on a specific time based requirement related to expected degradation rates. The surfaces subject to inspection are coated to minimize corrosion with a painting system that has been demonstrated to be acceptable for use in reactor containments. These surfaces are in an inerted environment, which helps to reduce the corrosion rate. In the event that excessive corrosion is found, this condition would be evaluated for acceptability for the next operating cycle or the condition corrected.

Conclusion SR 4.7.A.1
Based on the proven life of the containment coating system and the normally inerted environment these surfaces are exposed to during normal plant operations, this surveillance interval can be safely extended to accommodate a 24 month operating cycle. Historical surveillance test data from the past ten years supports this conclusion.

Suppression Chamber to Drywell Vacuum Breaker Tests (SR 4.7.A.5.c and 4.7.A.5.g)
SR 4.7.A.5.c requires a once per operating cycle visual inspection of the suppression chamber to drywell vacuum breaker valves to insure proper maintenance and operation. SR 4.7.A.5.g requires that once each refueling outage, each vacuum breaker be force-tested and inspected and verified to meet design requirements.

The Primary Containment is equipped with five drywell to torus vacuum breaker valves which prevent primary containment pressure from dropping below its vacuum rating relative to the external design pressure. The vacuum breaker valves draw noncondensables from the torus to prevent the drywell vacuum rating from being exceeded. These valves are 30 inch diameter swing check valves equipped with counterweighted arms which open when torus pressure exceeds drywell pressure by 0.5psid. They are seated with increased pressure on the drywell side.

The vacuum breaker valves are exercised through an opening - closing cycle monthly. Each valve is operated manually using the counterweight lever and smooth valve operation is verified. The remote full open and full closed indications are verified during this test. The vacuum breakers are tested periodically in accordance with the requirements of the American Society of Mechanical Engineers (ASME) Section XI Inservice Testing (IST) Program. This test verifies operation and setpoint of the vacuum breakers by opening the valves with a calibrated torque wrench. It also verifies maintenance and operation of the valves by a visual inspection. This combination of on-line testing is sufficient to detect operability problems with the valves.

Conclusion SRs 4.7.A.5.c and 4.7.A.5.g
Based on existing on-line functional testing, this surveillance interval can be safely extended to accommodate a longer operating cycle. Historical surveillance test data supports this conclusion.

Drywell to Torus Structure Leak Test (SR 4.7.A.5.d)
This SR requires a once per operating cycle leak test of the drywell to torus structure. This testing verifies that bypass leakage, through the suppression chamber to drywell vacuum breakers, is limited to 71 standard cubic feet per minute (SCFM). This provides assurance that steam released to the drywell during a postulated LOCA will flow to, and be condensed by, the water in the suppression pool. The leakage limit of 71 scfm of nitrogen is approximately one-tenth the maximum allowable bypass capacity.

A review of test results from 1987 to 1994 revealed one test failure which was caused by a valve required to establish test conditions. The test was completed successfully after the valve was repaired and drywell bypass leakage was within the acceptance criteria.

In addition, the pressure in the drywell is kept at least 1.7 psi greater than the pressure in the torus to ensure that appropriate torus and support system safety margins are maintained following a postulated DBA. This differential pressure is monitored once each shift. An abrupt differential pressure drop would alert operators of possible bypass leakage. This condition would be investigated and appropriate corrective actions taken.

Conclusion SR 4.7.A.5.d
The past leak test results and on-line monitoring of containment differential pressure ensures with a high degree of confidence that extension of the test interval to support a 24 month cycle will not adversely affect drywell bypass leakage.

SGT Combined Filter Differential Pressure and Heater Power Tests (SR 4.7.B.1.a)
SR 4.7.B.1.a specifies once per cycle surveillance testing to be performed on the SGT System. These surveillances determine combined filter differential pressure and measure heater power.

SR 4.7.B 1.a.(1) requires a demonstration that the pressure drop across the combined HEPA and charcoal filters is less than 5.7 inches of water at 6,000 scfm. This test is performed to detect gross plugging of the filter media.

The system is normally in a standby condition, therefore gross plugging or fouling of the HEPA filters and charcoal adsorbers is minimized. Individual filter differential pressures are monitored during periods of system operation. In addition, alarms are provided in the control room to alert operators of high filter differential pressures during system operation. In the event of abnormal differential pressures, the cause would be investigated and deficiency corrected. The SGT system has dual filter trains ensuring system availability in the event of failure of one filter train.

SR 4.7.B.1.a.(2) requires a demonstration that each SGT system heater dissipates greater than 29kW of electric power. Each SGT system train is equipped with an electric heater which is energized during system operation. These heaters maintain relative humidity at the charcoal filters below 70% in order to assure the efficient removal of iodine in the charcoal filters.

The SGT system is normally in a standby condition with the heater elements de-energized. This decreases the possibility of heating coil damage or failure due to foreign material impingement and minimizes wear on the heating ele ents and control circuits. The operation of the heater is verified during system operation and any abnormal indications would be observed and the cause corrected. The 29 kW heating requirement is easily met by the larger heating capacity of the 39 kW heaters. This large capacity of the heaters compared to the heating requirement provides enough margin so that minor degradation can be accommodated.

Conclusion SR 4.7.B.1.a
Based on the redundant design of the SGT system and monitoring of individual filter differential pressure and electric heater operation during periods of system operation, these surveillance intervals can be safely extended to support a 24 month operating cycle. Historical surveillance test data from the past ten years supports this conclusion.

<u>SGT System Simulated Automatic Initiation (SR 4.7.B.1.d)</u>
This SR requires a once per operating cycle demonstration of the automatic initiation of each train of the SGT system. This ensures, in conjunction with other system tests, that the SGT system is capable of performing its design safety function. System instrumentation is periodically tested on-line. Major system components are tested on-line in accordance with the ASME Section XI IST Program requirements. During this testing, system motor operated valves are cycled and the fans are also started. The SGT system has redundant filter trains and is normally in the standby condition.

Conclusion SR 4.7.B.1.d
This surveillance can be safely extended since system instrumentation and mechanical components are tested periodically on-line. Historical surveillance test data supports this conclusion.

SGT Manual Suction Cross-tie Bypass Valves for Filter Cooling Operability (SR 4.7.B.1.e)

This SR requires a once per operating cycle demonstration of the operability of the manual suction cross-tie bypass valves for filter cooling. The SGT filter trains are cross-tied at the fan suctions to allow cool air to be drawn over the charcoal filters of the inactive filter train. The air flow provides cooling of the charcoal filter from a fire safety standpoint and also prevents iodine desorption from charcoal filters as the result of elevated temperatures. There is little possibility of valve failure in a closed position (that could cause a no-flow condition in the inactive train) since the valves are kept open during power operation. The valves are only operated during the once per cycle surveillance testing and when isolating a train for maintenance. Upon restoration of a SGT train following maintenance, the valves would be verified open during the valve lineup. Since the valves are infrequently operated, they are unlikely to wear out due to fatigue.

Conclusion SR 4.7.B.1.e

This surveillance interval can be safely extended to support a 24 month operating cycle because these manually operated valves are normally open during plant operation, are infrequently operated, and are verified open upon restoration of a SGT train per the valve lineup. Historical surveillance test data from the past ten years supports this conclusion.

Secondary Containment Capability Testing (SR 4.7.C.1.c)

This SR requires that the secondary containment capability to maintain a 0.25 in of water vacuum under calm wind conditions with a SGT filter train flow rate of $\leq$ 6,000 cfm, be demonstrated at each refueling outage prior to refueling. This testing demonstrates the proper operation of the reactor building isolation valves, leak tightness of the reactor building and performance of the SBGT system.

During normal operation, reactor building differential pressure is controlled by the Reactor Building Isolation and Control System. This system maintains differential pressure at greater than negative 0.25 inches of water. Reactor building differential pressure and system flow rate is monitored once per shift in the control room. The likelihood of leakage during power operation is minimal due to the passive design of the reactor building. Performance of work that could affect secondary containment penetrations and components is administratively controlled. A review of past surveillance test results (1988 through 1993) indicated that the SGT has been able to maintain the reactor building differential pressure within the test acceptance criteria.

Conclusion 4.7.C.1.c
This SR interval can be safely extended to support a 24 month operating cycle because there is a low likelihood of reactor building leakage during power operation due to its passive design and there is sufficient administrative controls of work on secondary containment penetrations. Historical surveillance test data from the past ten years supports this conclusion.

Power Operated Primary Containment Isolation Valve Simulated Automatic Initiation and Closure Time Testing (SR 4.7.D.1.a)
This SR requires a simulated automatic initiation and closure time test for each operable power operated primary containment isolation valve once per operating cycle. The test verifies the ability of the system to perform its design automatic function by confirming proper operation of electrical and mechanical components. Closing times for these valves are verified to ensure that they will close fast enough to restrict the release of radioactive material to the environs well below the guidelines of 10 CFR 100.

The Primary Containment and Reactor Vessel Isolation Control System (PCRVICS) provides timely protection against the consequences of accidents involving the release of radioactive materials from the fuel or the reactor coolant system. The system initiates automatic isolation of appropriate process lines which penetrate the primary containment whenever monitored variables exceed pre-selected limits. Isolation is accomplished by primary containment isolation valves, which are highly reliable and have low service requirements. The majority of these primary containment isolation valves are normally closed during plant operation. The PCRVICS is designed with a high probability that when any essential monitored variable exceeds the isolation setpoint, the event results in automatic isolation. The system is designed such that no single failure within the PCRVICS prevents an isolation action when required.

Power operated primary containment isolation valves which can be cycled during normal plant operations are cycled, and stroke times measured periodically on-line in accordance with the ASME Section XI IST Program. Primary Containment isolation initiating and actuation logic are periodically tested to verify proper response. This combination of on-line testing adequately verifies operability of initiating logic and mechanical components.

Conclusion 4.7.D.1.a
Based on existing on-line testing, high reliability of these valves, and the redundant design of the PCRVICS the simulated automatic initiation and stroke time testing intervals can be safely extended to support a 24 month operating cycle. Historical surveillance test data supports this conclusion.

Technical Specification Bases Changes
The proposed Bases changes on Technical Specification page 195 change wording relating to "once per operating cycle" to "once per 24 months. The bases changes clarify the new surveillance intervals and do not propose new or different system design limits. As such, there are no safety implications in these proposed bases changes.

The proposed bases change on page 196 deletes the numerical value of the failure probability that a line will not isolate. The failure probability of 1.1 X 10-7 that a line will not isolate was contained in the original FitzPatrick Plant Technical Specification Bases and was representative of a 12 month operating cycle. The methodology used to derive this value was contained in the Technical Specification Section 4.2 Bases and Figure 4.2-1, "Test Interval Vs. Probability of System Unavailability," located on page 87. This figure and section were deleted by Amendment 227 to the FitzPatrick Technical Specifications. This statement was overlooked during the development of amendment 227, and should have been deleted.

IV. EVALUATION OF SIGNIFICANT HAZARDS CONSIDERATION

Operation of the FitzPatrick plant in accordance with the proposed Amendment would not involve a significant hazards consideration as defined in 10 CFR 50.92, since it would not:

1. involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes do not involve any physical changes to the plant, do not alter the way the containment systems function, and will not degrade the performance of the containment systems. The type of testing and the corrective actions required if the subject surveillances fail remains the same. The proposed changes do not adversely affect the availability of the containment systems or affect the ability of the systems to meet their design objectives. A historical review of surveillance test results indicated that there was no evidence of any failures which would invalidate the above conclusions.

2. create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed changes do not modify the design or operation of the plant and therefore no new failure modes are introduced. No changes are proposed to the type and method of testing performed, only to the length of the surveillance interval. Past equipment performance and on-line testing indicate that longer test intervals will not degrade the containment systems. A historical review of surveillance test results indicated that there was no evidence of any failures which would invalidate the above conclusions.

3. involve a significant reduction in a margin of safety.

Although the proposed changes will result in an increase in the interval between surveillance tests, the impact on system reliability is minimal. This is based on more frequent on-line testing and the redundant design of the containment systems. A review of past surveillance history has shown no evidence of failures which would significantly impact the reliability of the containment systems. Operation of the plant remains unchanged by the proposed containment system surveillance test interval extensions. The assumptions in the Plant Licensing Basis are not impacted. Therefore the proposed changes do not result in a significant reduction in the margin of safety.

V. IMPLEMENTATION OF THE PROPOSED CHANGE

Implementation of the proposed changes will not adversely affect the ALARA or Fire Protection Programs at the FitzPatrick plant, nor will the changes affect the environment.

VI. CONCLUSION

Based on the discussion above, the identified containment surveillance tests can be safely extended to accommodate a 24 month operating cycle. The assumptions in the FitzPatrick licensing basis are not invalidated by performing the containment surveillances at the bounding interval limits (30 months) to accommodate the 24 month operating cycle.

The Plant Operating Review Committee (PORC) and the Safety Review Committee (SRC) have reviewed these proposed changes to the Technical Specifications and have concluded that they do not involve an unreviewed safety question, or a significant hazards consideration, and will not endanger the health and safety of the public.

VII. REFERENCES

1. Generic Letter 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate 24-Month Fuel Cycle."

2. NYPA document JAF-RPT-MULTI-01116, "Containment Systems Surveillance Test Extensions," dated May 27, 1994.

3. NYPA memorandum, S. Haskell to F. Lake (JSED-95-0395) dated October 13, 1995 regarding Supplementary Data for Surveillance Test Extension Evaluation.

ATTACHMENT III to JPN-95-046

Markup of the current Technical Specification pages
Extension of Containment Systems Surveillance Test Intervals
to Accommodate 24-Month Operating Cycles (JPTS-95-001D)

New York Power Authority

JAMES A. FITZPATRICK NUCLEAR POWER PLANT
Docket No. 50-333
DPR-59

3.7 LIMITING CONDITIONS FOR OPERATION

3.7 CONTAINMENT SYSTEMS

Applicability:

Applies to the operating status of the primary and secondary containment systems.

Objective:

To assure the integrity of the primary and secondary containment systems.

Specification:

A. Primary Containment

1. The level from the bottom of the torus and temperature of the water in the torus shall be maintained within the following limits whenever the reactor is critical or whenever the reactor coolant temperature is greater than 212°F and irradiated fuel is in the reactor vessel:

   a. Maximum level of 14.00 feet.

   b. Minimum level of 13.88 feet.

   The torus water level may be outside the above limits for a maximum of four (4) hours as a result of required operability testing of HPCI, RCIC, RHR, CS, and the Drywell - Torus Vacuum Relief System.

   c. Maximum water temperature

      (1) During normal power operation maximum water temperature shall be 95°F.

4.7 SURVEILLANCE REQUIREMENTS

4.7 CONTAINMENT SYSTEMS

Applicability:

Applies to the primary and secondary containment integrity.

Objective:

To verify the integrity of the primary and secondary containment systems.

Specification:

A. Primary Containment

1. The torus water level and temperature shall be monitored as specified in Table 4.2-8.

   The accessible interior surfaces of the drywell and above the water line of the torus shall be inspected each operating cycle for evidence of deterioration.

   once per 24 months

   Whenever there is indication of relief valve operation or testing which adds heat to the suppression pool, the pool temperature shall be continuously recorded until the heat addition is terminated. The operator will verify that average temperature is within applicable limits every 5 minutes. In lieu of continuous recording, the operator shall log the temperature every 5 minutes.

   Whenever there is indication of relief valve operation with the temperature of the suppression pool reaching 160°F or more and the primary coolant system pressure greater than 200 psig, an external visual examination of the torus shall be conducted before resuming power operation.

3.7 (cont'd)

breaker is sooner made operable, provided that the repair procedure does not violate primary containment integrity.

5. Pressure Suppression Chamber - Drywell Vacuum Breakers

a. When primary containment integrity is required, all drywell suppression chamber vacuum breakers shall be operable and positioned in the fully closed position except during testing and as specified in 3.7.A.5.b below.

b. One drywell suppression chamber vacuum breaker may be non-fully closed so long as it is determined to be not more than 1° open as indicated by the position lights.

c. One drywell suppression chamber vacuum breaker may be determined to be inoperable for opening.

1

d. Deleted

4.7 (cont'd)

5. Pressure Suppression Chamber - Drywell Vacuum Breakers

a. Each drywell suppression chamber vacuum breaker shall be exercised through an opening - closing cycle monthly.

b. When it is determined that one vacuum breaker is inoperable for fully closing when operability is required, the operable breakers shall be exercised immediately, and every 15 days thereafter until the inoperable valve has been returned to normal service.

per 24 months,

c. Once each operating cycle, each vacuum breaker valve shall be visually inspected to insure proper maintenance and operation.

24 months

d. A leak test of the drywell to suppression chamber structure shall be conducted once per operating cycle; the acceptable leak rate is ≤0.25 in. water/min, over a 10 min period, with the drywell at 1 psid.

3.7 (cont'd)

e. Leakage between the drywell and suppression chamber shall not exceed a rate of 71 scfm as monitored via the suppression chamber 10 min pressure transient of 0.25 in. water/min.

f. The self actuated vacuum breakers shall open when subjected to a force equivalent to 0.5 psid acting on the valve disc.

g. From and after the date that one of the pressure suppression chamber/drywell vacuum breakers is made or found to be inoperable for any reason, the vacuum breaker shall be locked closed and reactor operation is permissible only during the succeeding seven days unless such vacuum breaker is sooner made operable, provided that the repair procedure does not violate primary containment integrity.

4.7 (cont'd)

e. Not applicable

f. Not applicable

Once per 24 months,

g. During each refueling outage each vacuum breaker shall be tested to determine that the force required to open the vacuum breaker does not exceed the force specified in Specification 3.7.A.5.f and each vacuum breaker shall be inspected and verified to meet design requirements.

3.7 (cont'd)

B. Standby Gas Treatment System

1. Except as specified in 3.7.B.2 below both circuits of the Standby Gas Treatment System shall be operable at all times when secondary containment integrity is required.

4.7 (cont'd)

B. Standby Gas Treatment System

1. Standby Gas Treatment System surveillance shall be performed as indicated below:

Once per 24 months,

a. At least once per operating cycle, it shall be demonstrated that:

(1) Pressure drop across the combined high-efficiency and charcoal filters is less than 5.7 in. of water at 6,000 scfm, and

(2) Each 39kW heater shall dissipate greater than 29kW of electric power as calculated by the following expression:

$$P = \sqrt{3}EI$$

where:
P = Dissipated Electrical Power;
E = Measured line-to-line voltage in volts (RMS);
I = Average measured phase current in amperes (RMS).

b. At least once during each scheduled secondary containment leak rate test, whenever a filter is changed, whenever work is performed that could affect the filter system efficiency, and at intervals not to exceed six months between refueling outages, it shall be demonstrated that:

(1.) The removal efficiency of the particulate filters is not less than 99 percent based on a DOP test per ANSI N101.1-1972 para. 4.1.

(2.) The removal efficiency of each of the charcoal filters is not less than 99 percent based on a Freon test.

c. At least once each yr, removable charcoal cartridges shall be removed and absorption capability shall be demonstrated.

d. At least once per operating cycle, automatic initiation of each branch of the Standby Gas Treatment System shall be demonstrated.

Once per 24 months

3.7 (cont'd)

2. From and after the date that one circuit of the Standby Gas Treatment System is made or found to be inoperable for any reason, the following would apply:

   a. If in Start-up/Hot Standby, Run or Hot Shutdown mode, reactor operation or irradiated fuel handling is permissible only during the succeeding 7 days unless such circuit is sooner made operable, provided that during such 7 days all active components of the other Standby Gas Treatment Circuit shall be operable.

   b. If in Refuel or Cold Shutdown mode, reactor operation or irradiated fuel handling is permissible only during the succeeding 31 days unless such circuit is sooner made operable, provided that during such 31 days all active components of the other Standby Gas Treatment Circuit shall be operable.

3. If Specifications 3.7.B.1 and 3.7.B.2 are not met, the reactor shall be placed in the cold condition and irradiated fuel handling operations and operations that could reduce the shutdown margin shall be prohibited.

4.7 (cont'd)

Once per 24 months

e. At least once per operating cycle, manual operability of the bypass valve for filter cooling shall be demonstrated.

f. Standby Gas Treatment System Instrumentation Calibration:

differential pressure switches	Once/operating Cycle

2. When one circuit of the Standby Gas Treatment System becomes inoperable, the operable circuit shall be verified to be operable immediately and daily thereafter.

3. Intentionally Blank

3.7 (cont'd)

D. Primary Containment Isolation Valves

1. Whenever primary containment integrity is required per 3.7.A.2, containment isolation valves and all instrument line excess flow check valves shall be operable, except as specified in 3.7.D.2. The containment vent and purge valves shall be limited to opening angles less than or equal to that specified below:

Valve Number	Maximum Opening Angle
27AOV-111	40°
27AOV-112	40°
27AOV-113	40°
27AOV-114	50°
27AOV-115	50°
27AOV-116	50°
27AOV-117	50°
27AOV-118	50°

4.7 (cont'd)

c. Secondary containment capability to maintain a 1/4 in. of water vacuum under calm wind conditions with a filter train flow rate of not more than 6,000 cfm, shall be demonstrated at each refueling outage prior to refueling. e

Once per 24 months

D. Primary Containment Isolation Valves

1. The primary containment isolation valves surveillance shall be performed as follows:

Once per 24 months,

a. At least once per operating cycle, the operable isolation valves that are power operated and automatically initiated shall be tested for simulated automatic initiation and for closure time.

b. At least once per operating cycle, the instrument line excess flow check valves shall be tested for proper operation.* e

c. At least once per quarter:

(1.) All normally open power-operated isolation valves (except for the main stream line and Reactor Building Closed Loop Cooling Water System (RBCLCWS) power-operated isolation valves) shall be fully closed and reopened.

* The current surveillance interval for testing instrument line excess flow check valves is extended until the end of the R11/C12 refueling outage scheduled for January, 1995. This is a one-time extension, effective only for this surveillance interval. The next surveillance interval will begin upon completion of this surveillance.

building isolation valves, leak-tightness of the reactor building and performance of the Standby Gas Treatment System. Functionally testing the initiating sensors and associated trip channels demonstrates the capability for automatic actuation. Performing these tests prior to refueling will demonstrate secondary containment capability prior to the time the primary containment is opened for refueling. Periodic testing gives sufficient confidence of reactor building integrity and Standby Gas Treatment System performance capability.

The test frequencies are adequate to detect equipment deterioration prior to significant defects, but the tests are not frequent enough to load the filters, thus reducing their reserve capacity too quickly. That the testing frequency is adequate to detect deterioration was demonstrated by the tests which showed no loss of filter efficiency after 2 yr. of operation in the rugged shipboard environment on the NS Savannah (ORNL 3726). Pressure drop tests across filter sections are performed to detect gross plugging or leak paths through the filter media. Considering the relatively short time that the fans may be run for test purposes, plugging is unlikely, and the test interval of once per operating cycle is reasonable. Duct heater tests will be conducted once during each operating cycle. Considering the simplicity of the heating circuit, the test frequency is sufficient.

24 months

per 24 months

The in place testing of charcoal filters is performed using Freon or equivalent, which is injected into the system upstream of the charcoal filters. Measurements of the Freon concentration upstream and downstream of the charcoal filters is made. The ratio of the inlet and outlet concentrations gives an overall indication of the leak tightness of the system. Although this is basically a leak test, since the filters have charcoal of known efficiency and holding capacity for elemental iodine and/or methyl iodine, the test also gives an indication of the relative efficiency of the installed system.

High-efficiency particulate filters are installed to minimize potential release of particulates to the environment. An efficiency of 90 percent is adequate to retain particulates that may be released to the reactor building following an accident. This will be demonstrated by in-place testing with DOP as testing medium.

4.7 BASES (cont'd)

moved to page 195

by in-place testing with DOP as testing medium.

The test interval for filter efficiency was selected to minimize plugging of the filters. In addition, retention capacity in terms of milligrams of iodine per gram of charcoal will be demonstrated. This will be done by testing the charcoal once a year, unless filter efficiency seriously deteriorates. Since shelf lives greater than 5 yr. have been demonstrated, the test interval is reasonable.

D. Primary Containment Isolation Valves

The large pipes comprising a portion of the Reactor Coolant System, whose failure could result in uncovering the reactor core, are supplied with automatic isolation valves (except those lines needed for Emergency Core Cooling Systems operation or containment cooling). Valve closure times are adequate to prevent loss of more coolant from the circumferential rupture of any of these lines outside the containment than from a steam line rupture. Therefore, isolation valve closure times are sufficient to prevent uncovering the core.

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In order to assure that the doses that may result from a steam line break do not exceed the 10CFR100 guidelines, it is necessary that no fuel rod perforation resulting from the accident occur prior to closure of the main steam line isolation valves. Analyses indicate that fuel rod cladding perforations would be avoided for main steam valve closure times, including instrument delay, as long as 10.5 sec.

For Reactor Coolant System temperatures less than 212°F, the containment could not become pressurized due to a loss-of-coolant accident. The 212°F limit is based on preventing pressurization of the reactor building and rupture of the blowout panels.

The primary containment isolation valves are highly reliable, have low service requirement, and most are normally closed. The initiating sensors and associated trip channels are also checked to demonstrate the capability for automatic isolation. The test interval of once per operating cycle for automatic initiation results in a failure probability of 1.1×10^{-7} that a line will not isolate. More frequent testing for valve

Power operated primary containment isolation valves that can be cycled during normal plant operations are cycled periodically per the ASME Section XI Inservice Testing Program. Valves that can not be cycled during normal plant operations are tested once every 24 months. The initiating sensors and associated trip channels are periodically checked to demonstrate proper response. This combination of testing adequately verifies operability of power operated and automatically initiated primary containment isolation valves.

4.7 BASES (cont'd)

operability results in a more reliable system.

The main steam line isolation valves are functionally tested on a more frequent interval to establish a high degree of reliability.

The primary containment is penetrated by several small diameter instrument lines connected to the reactor coolant system. Each instrument line contains a 0.25 in. restricting orifice inside the primary containment and an excess flow check valve outside the primary containment.

The RBCLCWS valves are excluded from the quarterly surveillance requirements because closure of these valves will eliminate the coolant flow to the drywell air and recirculation pump-motor coolers. Without cooling water, the drywell air and equipment temperature will increase and may cause damage to the equipment during normal plant operations. Therefore, testing of these valves would only be conducted in the cold condition.

A list of containment isolation valves, including a brief description of each valve is included in Section 7.3 of the updated FSAR.

ATTACHMENT IV to JPN-95-046

Reference 2
NYPA Report JAF-RPT-MULTI-01116 Rev. 1
Containment Systems Surveillance Test Extensions

New York Power Authority

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