50-333

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 16, 1996

Mr. William J. Cahill, Jr.
Chief Nuclear Officer
Power Authority of the State
of New York
123 Main Street
White Plains, NY 10601

SUBJECT: ISSUANCE OF AMENDMENT FOR JAMES A. FITZPATRICK NUCLEAR POWER PLANT (TAC NOS. M92631, M93725, M94084 AND M94210)

Dear Mr. Cahill:

The Commission has issued the enclosed Amendment Nos. 232 to Facility Operating License No. DPR-59 for the James A. FitzPatrick Nuclear Power Plant. The amendments consist of changes to the Technical Specifications (TSs) in response to your applications transmitted by letters dated June 15, September 15, October 25, and November 30, 1995.

The amendment modifies the TSs regarding the Control Rod System, the Auxiliary Electrical Systems, the Containment Systems, and the Standby Liquid Control System.

Specifically, the requested changes to the Control Rod System would revise TS Section 4.3.A, Reactivity Limitations, and Section 4.3.C, Scram Insertion Times, to clarify control rod testing requirements and to reflect the change to a 24-month operation cycle.

The requested changes to the Auxiliary Electrical Systems would revise TS Section 4.9.B, Emergency A-C Power System, Section 4.9.E, Station Batteries, and 4.9.F, Low-Pressure Coolant Injection Motor-Operated Valves Independent Power Supplies, and their associated Bases, and to add new TSs, to clarify requirements, and to reflect the change to the length of the operating cycle to 24 months.

The requested changes to the Containment Systems would revise TS Section 4.7.A, Primary Containment, Section 4.7.B, Standby Gas Treatment System, Section 4.7.C, Secondary Containment, and Section 4.7.D, Primary Containment Isolation Valves, and their associated Bases, and to add clarifying requirements, and to reflect the change to the length of the operating cycle to 24 months.

The requested changes to the Standby Liquid Control System would revise TS Section 4.4.A, Normal Operation, and Section 4.4.C, Sodium Pentaborate Solution, and their associated Bases, to add clarifying requirements, and to reflect changes to the length of the operating cycle to 24 months.

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The requested TS changes to delete "At least" on pages 105 through 107, in TS 4.4.A 1 through 4.4.C.1 changes the frequency of surveillance and had no technical justification. Therefore, these changes were unacceptable.

The post calibration data for the temperature and level elements associated with the sodium pentaborate storage tank and pump suction piping does not support extension of the calibration frequency to support a 24-month operating cycle.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

/S/

Karen R. Cotton, Acting Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-333

Enclosures: 1. Amendment No. 232 to DPR-59
2. Safety Evaluation

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The requested TS changes to delete "At least" on pages 105 through 107, in TS 4.4.A 1 through 4.4.C.1 changes the frequency of surveillance and had no technical justification. Therefore, these changes were unacceptable.

The post calibration data for the temperature and level elements associated with the sodium pentaborate storage tank and pump suction piping does not support extension of the calibration frequency to support a 24-month operating cycle.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

Karen R Cotton

Karen R. Cotton, Acting Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-333

Enclosures: 1. Amendment No. 232 to DPR-59
2. Safety Evaluation

cc w/encls: See next page

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DATED: August 16, 1996

AMENDMENT NO. 232 TO FACILITY OPERATING LICENSE NO. DPR-59-FITZPATRICK

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

POWER AUTHORITY OF THE STATE OF NEW YORK

DOCKET NO. 50-333

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 232
License No. DPR-59

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by Power Authority of the State of New York (the licensee) dated June 15, September 15, October 25, and November 30, 1995, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-59 is hereby amended to read as follows:

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(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 232, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance to be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Jocelyn A. Mitchell

Jocelyn A. Mitchell, Acting Director
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 16, 1996

ATTACHMENT TO LICENSE AMENDMENT NO. ____

FACILITY OPERATING LICENSE NO. DPR-59

DOCKET NO. 50-333

Revise Appendix A as follows:

Remove Pages	Insert Pages
88	88
96	96
105	105
106	106
107	107
109	109
109a	109a
165	165
178	178
179	179
181	181
182	182
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196	196
197	197
217	217
222	222
222a	222a
222b	222b
226	226

3.3 LIMITING CONDITION FOR OPERATION

3.3 REACTIVITY CONTROL

Applicability:

Applies to the operational status of the Control Rod System.

Objective:

To assure the ability of the Control Rod System to control reactivity.

Specification:

A. Reactivity Limitations

1. Reactivity margin - core loading

A sufficient number of control rods shall be operable so that the core could be made subcritical in the most reactive conditions during the operating cycle with the strongest control rod fully withdrawn and all other operable control rods fully inserted.

4.3 SURVEILLANCE REQUIREMENT

4.3 REACTIVITY CONTROL

Applicability:

Applies to the surveillance requirements of the Control Rod System.

Objective:

To verify the ability of the Control Rod System to control reactivity.

Specification:

A. Reactivity Limitations

1. Reactivity margin - core loading

Sufficient control rods shall be withdrawn following a refueling outage when core alterations were performed to demonstrate with a margin of 0.38 percent $\Delta k/k$ the core can be made subcritical at any time in the subsequent fuel cycle with the analytically determined strongest control rod fully withdrawn and all other operable rods fully inserted.

3.3.C (cont'd)

2. The average of the scram insertion times for the three fastest operable control rods of all groups of four control rods in a two-by-two array shall be no greater than:

Control Rod Notch Position Observed	Average Scram Insertion Time (Seconds)
46	0.361
38	0.977
24	2.112
04	3.764

3. The maximum scram insertion time for 90 percent insertion of any operable control rod shall not exceed 7.00 sec.

4.3.C (cont'd)

2. At 16-week intervals, 10 percent of the operable control rod drives shall be scram timed above 950 psig. The same control rod drives should not be tested each interval. Whenever such scram time measurements are made, an evaluation shall be made to provide reasonable assurance that proper control rod drive performance is being maintained.

3. All control rods shall be determined operable once every 24 months by demonstrating the scram discharge volume drain and vent valves operable when the scram test initiated by placing the mode switch in the SHUTDOWN position is performed as required by Table 4.1-1 and by verifying that the drain and vent valves:

   a. Close in less than 30 seconds after receipt of a signal for control rods to scram, and

   b. Open when the scram signal is reset.

3.4 LIMITING CONDITIONS FOR OPERATION

3.4 STANDBY LIQUID CONTROL SYSTEM

Applicability:

Applies to the operating status of the Standby Liquid Control System.

Objective:

To assure the availability of a system with the capability to shut down the reactor and maintain the shutdown condition without control rods.

Specifications

A. Normal Operation

During periods when fuel is in the reactor and prior to startup from a cold condition, the Standby Liquid Control System shall be operable except as specified in 3.4.B below. This system need not be operable when the reactor is in the cold condition, all rods are fully inserted and Specification 3.3.A is met.

4.4 SURVEILLANCE REQUIREMENTS

4.4 STANDBY LIQUID CONTROL SYSTEM

Applicability:

Applies to the periodic testing requirements for the Standby Liquid Control System.

Objective

To verify the operability of the Standby Liquid Control System.

Specification:

A. Normal Operation

The operability of the Standby Liquid Control System shall be verified by performance of the following tests:

1. At least once per month -

   Demineralized water shall be recycled to the test tank. Pump minimum flow rate of 50 gpm shall be verified against a system head of $\geq$1,275 psig.

2. Once per 24 months -

   Manually initiate the system, except the explosive valves. Pump solution through the recirculation path.

4.4 (cont'd)

Explode one of three primer assemblies manufactured in the same batch to verify proper function. Then install the two remaining primer assemblies of the same batch in the explosive valves.

Demineralized water shall be injected into the reactor vessel to test that valves (except explosive valves) not checked by the recirculation test are not clogged.

Test that the setting of the system pressure relief valves is between 1,400 and 1,490 psig.

3. Once per 24 months -

Disassemble and inspect one explosive valve so that it can be established that the valve is not clogged. Both valves shall be inspected within two test intervals.

B. Operation with Inoperable Components

From and after the date that a redundant component is made or found to be inoperable, Specification 3.4.A shall be considered fulfilled, and continued operation permitted, provided that:

1. The component is returned to an operable condition within 7 days.

B. Operation with Inoperable Components

When a component becomes inoperable its redundant component shall be verified to be operable immediately and daily thereafter.

3.4 (cont'd)

C. Sodium Pentaborate Solution

The standby liquid control solution tank shall contain a boron bearing solution with a minimum enrichment of 34.7 atom percent of B-10 that satisfies the volume- concentration requirements of Fig. 3.4-1 at all times when the Standby Liquid Control System is required to be operable and the solution temperature including that in the pump suction piping shall not be less than the temperature presented in Fig. 3.4-2. Tank heater and the heat tracing system shall be operable whenever the SLCS is required in order to maintain solution temperature in accordance with Fig. 3.4-2. If these requirements are not met, restore the system to the above limits within eight hours or take action in accordance with Specification 3.4.D.

D. If specifications 3.4.A through C are not met, the reactor shall be in at least hot shutdown within the following 12 hours.

4.4 (cont'd)

C. Sodium Pentaborate Solution

The availability of the proper boron bearing solution shall be verified by performance of the following tests:

1. At least once per month -

   Boron concentration shall be determined. In addition, the boron concentration shall be determined any time water or enriched sodium pentaborate is added or if the solution temperature drops below the limits specified by Figure 3.4-2.

2. At least once per day -

   Solution volume and the solution temperature shall be checked.

3. At least once per 18 months -

   The temperature and level elements shall be calibrated.

4. Once per 24 months -

   Enrichment of B-10 (in atom percent) shall be checked.

D. Not Used

ATWS requirements are satisfied at all concentrations above 10 weight percent for a minimum enrichment of 34.7 atom percent of B-10.

Figure 3.4-1 shows the permissible region of operation on a sodium pentaborate solution volume versus concentration graph. This curve was developed for 34.7% enriched B-10 and a pumping rate of 50 gpm. Each point on this curve provides a minimum of 660 ppm of equivalent natural boron in the reactor vessel upon injection of SLC solution. At a solution volume of 2200 gallons, a weight concentration of 13% sodium pentaborate, enriched to 34.7% boron-10 is needed to meet shutdown requirements. The maximum storage volume of the solution is 4780 gallons which is the net overflow volume in the SLC tank.

Boron concentration, isotopic enrichment of boron-10, solution temperature, and volume are checked on a frequency adequate to assure a high reliability of operation of the system should it ever be required. Experience with pump operability indicates that monthly testing is adequate to detect if failures have occurred.

The only practical time to test the Standby Liquid Control System is during a refueling outage and by initiation from local stations. Because components of the system are checked periodically as described above, a functional test of the entire system on a frequency of more than once every 24 months is unnecessary. A test of explosive charges from one manufacturing batch is made to assure that the charges are satisfactory. A continuous check of the firing circuit continuity is provided by pilot lights in the control room.

The relief valves in the Standby Liquid Control System protect the system piping and positive displacement pumps, which are nominally designed for 1,500 psig, from overpressure. The pressure relief valves discharge back to the standby liquid control pump suction line.

B. Operation with Inoperable Components

Only one of two standby liquid control pumping circuits is needed for operation. If one circuit is inoperable, there is no immediate threat to shutdown capability, and reactor operation may continue during repairs. Assurance that the remaining system will perform its function is obtained by verifying pump operability in the operable circuit at least daily.

C. Sodium Pentaborate Solution

To guard against precipitation, the solution, including that in the pump suction piping, is kept at least 10°F above saturation temperature. Figure 3.4-2 shows the saturation temperature including 10°F margin as a function of sodium pentaborate solution concentration. Tank heater and heat tracing system are provided to assure compliance with this requirement. The set points for the automatic actuation of the tank heater and heat tracing system are established based on the solution concentration. Temperature and liquid level alarms for the system annunciate in the control room. Pump operability is checked on a frequency to assure a high reliability of operation of the system should it ever be required.

Once the solution is prepared, boron concentration does not vary unless more enriched sodium pentaborate or more water is added. Level indications and alarms indicate whether the solution volume has changed which might indicate a possible solution concentration change. The test interval has been established considering these factors.

Boron enrichment (B-10 atom percent) does not vary with the addition of enriched sodium pentaborate material or water to the SLC tank provided 34.7% enriched (B-10 atom percent) is added. Therefore, a check once every 24 months is adequate to ensure proper enrichment.

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.

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.

3.9 (cont'd)

3. From and after the time that one of the Emergency Diesel Generator Systems is made or found to be inoperable, continued reactor operation is permissible for a period not to exceed 7 days provided that the two incoming power sources are available and that the remaining Diesel Generator System is operable. At the end of the 7 day period, the reactor shall be placed in a cold condition within 24 hours, unless the affected diesel generator system is made operable sooner.

4. When both Emergency Diesel Generator Systems are made or found to be inoperable restore at least one system to operable status within two hours or place the reactor in the cold condition within the following 24 hours.

5. Deleted

4.9 (cont'd)

3. The emergency diesel generator system instrumentation shall be checked during the monthly generator test.

4. Once every 24 months, the conditions under which the Emergency Diesel Generator System is required will be simulated to demonstrate that the pair of diesel generators will start, accelerate, force parallel, and accept the emergency loads in the prescribed sequence.

5. Once within one hour and at least once per twenty-four hours thereafter while the reactor is being operated in accordance with Specifications 3.9.B.1, 3.9.B.2, or 3.9.B.3 the availability of the operable Emergency Diesel Generators shall be demonstrated by manual starting and force paralleling where applicable.

3.9 (cont'd)

3. From and after the time that both batteries are made or found to be inoperable for any reason, the reactor shall be in a cold condition within 24 hrs.

4.9 (cont'd)

3. Once every 24 months, during shutdown, each station battery shall be subjected to a service (duty cycle) test.[1]

4. Once every 60 months, during shutdown, each battery shall be subjected to a performance test (or modified performance test). This test shall verify that the battery capacity is at least 80% of the manufacturer's rating.

5. Accelerated performance testing (or modified performance test) shall be conducted on any battery:

   a) Annually if capacity drops more than 10% from its previous performance test (or modified performance test).

   b) Annually if capacity is below 90% of manufacturer's rating.

   c) Annually if it has reached 85% of its service life with capacity $<100\%$ of manufacturer's rating.

   d) Once every 24 months if it has reached 85% of its service life with capacity $\geq 100\%$ of the manufacturer's rating.

6. Each battery charger shall be visually inspected weekly and a performance test conducted once every 24 months.

7. Once/month: open the battery charger output breakers one at a time and observe performance for proper operation.

1. A modified performance test may be performed in lieu of the battery service test.

3.9 (cont'd)

F. LPCI MOV Independent Power Supplies

4.9 (cont'd)

F. LPCI MOV Independent Power Supplies

1. Every week the specific gravity, voltage and temperature of each pilot cell, and overall battery voltage shall be measured and chargers and inverters shall be visually inspected.

2. Every three months the following measurements shall be made:

   a. Voltage of each cell to the nearest of 0.01v;

   b. Specific gravity of each cell;

   c. Temperature of every fifth cell.

3. Once every 24 months, each battery shall be subjected to a service (duty cycle) test.[1]

4. Once every 60 months, each battery shall be subjected to a performance test (or modified performance test). This test shall verify that the battery capacity is at least 80% of the manufacturer's rating.

1. A modified performance test may be performed in lieu of the battery service test.

3.9 (con'd)

F. LPCI MOV Independent Power Supplies

1. Reactor shall not be made critical unless both independent power supplies, including the batteries, inverters and chargers and their associated buses (MCC-155 and MCC-165) are in service, except as specified below.

2. During power operation, if one independent power supply becomes unavailable, repairs shall be made immediately and continued reactor operation is permissible for a period not to exceed 7 days unless the unavailable train is made operable sooner. From and after the date one of the independent power supplies is made or found to be inoperable for any reason, the following would apply:

   a. The other independent power supply including its charger, inverter, battery and associated bus is operable.

   b. Pilot cell voltage, specific gravity and temperature and overall battery voltage are measured immediately and weekly thereafter for the operable independent power supply battery.

   c. The inoperable independent power supply shall be isolated from its associated LPCI MOV bus, and this bus will be manually switched to its alternate power source.

4.9 (con'd)

F. LPCI MOV Independent Power Supplies

5. Accelerated performance testing (or modified performance test) shall be conducted on any battery:

   a) Annually if capacity drops more than 10% from its previous performance test (or modified performance test).

   b) Annually if capacity is below 90% of manufacturer's rating.

   c) Annually if it has reached 85% of its service life with capacity $<100\%$ of manufacturer's rating.

   d) Once every 24 months if it has reached 85% of its service life with capacity $\geq 100\%$ of the manufacturer's rating.

6. Each battery charger and inverter shall be visually inspected weekly and a performance test conducted once every 24 months.

7. Once/month: open the battery charger A-C input breakers one at a time and observe performance for proper operation.

4.9 BASES (cont'd)

D. Not Used

E. Battery System

Measurements and electrical tests are conducted at specified intervals to provide indication of cell condition and to determine the discharge capability of the batteries. Performance and service tests are conducted in accordance with the recommendations of IEEE 450-1995.

The battery service (duty cycle) test demonstrates the capacity of the battery to meet the system design requirements. When a service test is used on a regular basis, it will reflect maintenance practices. The FitzPatrick design duty cycle loads are determined by a LOCA concurrent with a loss of normal and reserve power.

The performance (discharge) test is a test of the constant current capacity of a battery and can be conducted with the battery in an as-found condition after being subjected to an equalizing charge. If performance testing is to be used to reflect baselined battery trending capacity, then special conditions (including equalizing) are required to establish the battery in an as-known condition prior to the test. If performance testing is to be used to reflect maintenance practices as well as trending, the equalizing charge can be omitted.

The modified performance test is a composite test which envelopes both the service test and performance test requirements. The modified performance test discharge current envelopes the peak duty cycle loads of the service test followed by a constant discharge current (temperature corrected) for the performance test.

The purpose of the modified performance test is to demonstrate the battery has sufficient capacity to meet the system design requirements and to provide trendable performance data to compare the available capacity in the battery to previous capacity test results. The modified performance test may be performed in lieu of the battery service test.

The station batteries are required for plant operation, and performing the station battery service test and performance (or modified performance) test requires the reactor to be shut down.

F. LPCI MOV Independent Power Supply

Measurement and electrical tests are conducted at specified intervals to provide indication of cell condition, to determine the discharge capability of the battery. Performance and service tests are conducted in accordance with the recommendations of IEEE 450-1995.

G. Reactor Protection Power Supplies

Functional tests of the electrical protection assemblies are conducted at specified intervals utilizing a built-in test device and once per operating cycle by performing an instrument calibration which verifies operation within the limits of Section 4.9.G.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 232 TO FACILITY OPERATING LICENSE NO. DPR-59

POWER AUTHORITY OF THE STATE OF NEW YORK

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50-333

1.0 INTRODUCTION

By letters dated June 15, September 15, October 25, and November 30, 1995, the Power Authority of the State of New York (the licensee) submitted several requests for changes to the James A. FitzPatrick Nuclear Power Plant Technical Specifications (TS). The requested changes are to the Control Rod System, the Auxiliary Electrical Systems, the Containment Systems, and the Standby Liquid Control System.

Specifically, the requested changes to the Control Rod System would revise TS Section 4.3.A, Reactivity Limitations, and Section 4.3.C, Scram Insertion Times, to clarify control rod testing requirements and to reflect changes to the length of the operating cycle to 24 months.

The requested changes to the Auxiliary Electrical Systems would revise TS Section 4.9.B, Emergency A-C Power System, Section 4.9.E, Station Batteries, and 4.9.F, LPCI MOV Independent Power Supplies, and their associated Bases, to add new TSs, clarifying requirements, and to reflect changes to the length of the operating cycle to 24 months.

The requested changes to the Containment Systems would revise TS Section 4.7.A, Primary Containment, Section 4.7.B, Standby Gas Treatment System, Section 4.7.C, Secondary Containment, and Section 4.7.D, Primary Containment Isolation Valves, and their associated Bases, to add clarifying requirements, and to reflect changes to the length of the operating cycle to 24 months.

Surveillance intervals associated with 10 CFR Part 50 Appendix J required primary containment leakage rate testing are not being extended at this time, but 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, but are addressed in the January 25, 1996, 24-month cycle Instrumentation systems amendment request.

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The requested changes to the Standby Liquid Control System would revise TS Section 4.4.A, Normal Operation, and Section 4.4.C, Sodium Pentaborate Solution, and their associated Bases, to add clarifying requirements, and to reflect changes to the length of the operating cycle to 24 months.

2.0 EVALUATION

2.1 Control Rod System Changes

The control rod system is the primary reactivity control system for the reactor. The safety function of the control rod system is to provide rapid reactivity control (reactor scram) in order that no fuel damage results from any abnormal operating transient.

The proposed changes to the control rod system TSs are as follows:

1. Page 88, TS 4.3.A.1, change "strongest operable control rod fully withdrawn" to "strongest control rod fully withdrawn." The revised TS reads:

   Sufficient control rods shall be withdrawn following a refueling outage when core alterations were performed to demonstrate with a margin of 0.38 percent $\Delta k/k$ the core can be made subcritical at any time in the subsequent fuel cycle with the analytically determined strongest control rod fully withdrawn and all other operable rods fully inserted."

2. Page 96, TS 4.3.C.2, add the following after the first sentence: "The same control rod drives should not be tested each interval." The revised TS reads:

   "At 16 week intervals, 10 percent of the operable control rod drives should be scram timed above 950 psig. The same control rod drives should not be tested each interval. Whenever such scram time measurements are made, an evaluation shall be made to provide reasonable assurance that proper control rod drive performance is being maintained."

3. Page 96, TS 4.3.C.3, change "each operating cycle" to "every 24 months." The revised TS reads:

   "All control rods shall be determined operable once every 24 months by demonstrating the scram discharge volume drain and vent valves operable when the scram test initiated by placing the mode switch in the SHUTDOWN position is performed as required by Table 4.1-1 and by verifying that the drain and vent valves..."

2.1.1 Reactivity Margin - Core Loading Test, TS 4.3.A.1

The technical clarification in TS 4.3.A.1 deletes the term "operable" from the TS in order to better clarify that the analytically determined strongest control rod must be fully withdrawn for reactivity margin demonstration surveillances. In deleting this term, inoperable control rods are then also

bounded by this TS. This is a prudent clarification since the analytically determined strongest control rod could also be in an inoperable condition. This clarification agrees with the terminology used in the corresponding limiting condition for operation of 3.3.A.1. No additional surveillance test restrictions or relaxations are created by this change.

This test is performed following a refueling outage when core alterations are performed. The purpose of this test is to demonstrate with a margin of 0.38 percent $\Delta k/k$ that the reactor will be subcritical throughout the fuel cycle with the analytically determined strongest control rod fully withdrawn and all other rods inserted. The margin is typically demonstrated by bringing the reactor core to criticality, from a xenon free condition, by withdrawing control rods in a normal start-up sequence. A calculation is then performed to show that the reactivity thus added to the core exceeded the reactivity worth of the most worthy stuck rod + 0.38% +R $\Delta k/k$. The term R is the difference between the calculated value of maximum core reactivity during the operating cycle and the calculated beginning of cycle core reactivity (by definition R is $\geq$ 0). As such, this calculation takes into account the longer fuel cycle. This test is valid for the duration of the fuel cycle.

Based on the discussion above, the NRC staff finds it acceptable to delete the term "operable" from TS 4.3.A.1.

2.1.2 Control Rod Scram Time Test, TS 4.3.C.1

A technical clarification in TS 4.3.C.2 provides further information on testing so as to preclude the same control rod drives from being tested in subsequent 16-week intervals. This clarification results in a better indication of the overall control rod drive system operability. No additional surveillance test restrictions or relaxations are created by this change.

The control rod scram test time is also performed after each refueling outage, where all operable control rods are tested from the fully withdrawn position with the reactor at a pressure above 950 psig. This testing is completed prior to exceeding 40% power. The control rod system is designed to bring the reactor subcritical at a rate fast enough to prevent fuel damage. The design basis transient and accident analyses assume that all of the control rods scram at a specified insertion rate. Surveillance of each individual scram time ensures that the scram time assumed in the design basis transient and accident analysis can be met (i.e., TS values are not exceeded). Normal operating experience has shown that control rod scram times do not significantly change over an operating cycle. There are additional on-line surveillance tests to verify control rod operability. At 16-week intervals, 10 percent of the operable control rod drives are scram time tested above 950 psig. In addition, accumulator pressure is verified weekly and TSs also require testing of control rods if work is performed which may affect insertion time.

Based on the discussion above, the NRC staff finds the clarification to TS 4.3.C.2 acceptable.

2.1.3 Scram Discharge Instrument Volume (SDIV) Vent and Drain Valve Operability Test, TS 4.3.C.3

This test, performed once each operating cycle, demonstrates the scram discharge volume vent and drain valves close in less than 30 seconds from the time the reactor mode switch is placed in shutdown. This test was incorporated into the TSs in 1982 to reduce the susceptibility of scram discharge volume systems to common cause failures. This test is an integrated test of the SDIV drain and vent valves which demonstrates total system performance. It provides assurance that the valves operate automatically to close during a scram to limit the amount of reactor coolant discharged and to open on a scram reset to restore the SDIV system so that there is sufficient volume to accept the reactor coolant discharged during a subsequent scram.

Mechanical functionality of the system is assured by stroke testing of the valves and verifying valve position and accumulator level and pressure as required by TSs 4.3.A.2.b and 4.3.A.2.c. These tests and verifications are performed while the plant is on-line. Therefore, on-line testing provides adequate assurance of valve operability.

Functionality of the scram circuitry is assured once every 3 months. The scram circuitry has been previously evaluated for longer cycle length as part of the Reactor Protection System Surveillance Test Improvements report (Reference 3). Operability of the mode switch and reset relays is demonstrated during forced and planned shutdowns.

A review of recent surveillance tests from 1987 through 1992 indicated that the acceptance criteria were satisfied in all cases. However, one instance required additional action where a valve had to be verified open locally and cycled manually, before proper light indication in the control room was observed. In addition, quarterly on-line testing demonstrates SDIV vent and drain valve operability. Past performance of on-line testing has shown no problematic concerns.

Based on the discussion above, the SDIV and Drain Valve Operability test can be safely extended to accommodate a 24-month operating cycle.

The assumptions in the Fitzpatrick licensing basis are not invalidated by performing the control rod system surveillances at the bounding interval limits (30 months) to accommodate the 24-month operating cycle.

The current language of TSs 4.3.A.1 and 4.3.C.1 requires these surveillance tests to be conducted after each refueling outage. No revisions to these TSs are required since no operating cycle intervals are specified. However, since it is understood that these surveillance tests are required after 24-month operating cycles, the safety implications have been assessed.

Based on the above discussions, the NRC staff finds the proposed changes to TS Sections 4.3.A and 4.3.C acceptable.

2.2 Auxiliary Electrical Systems

The auxiliary electric systems assure an adequate source of electrical power to operate the auxiliary equipment during plant operation, to operate facilities to cool and lubricate the plant during shutdown, and to operate the engineered safeguards and emergency core cooling system (ECCS) equipment following a loss-of-coolant accident (LOCA).

The proposed changes to the auxiliary electric system TSs are as follows:

1. Page 217, TS 4.9.B.4, change "Once each operating cycle" to "Once every 24 months" at the beginning of the first sentence. The revised TS reads:

   "Once every 24 months, the conditions under which the Emergency Diesel Generator System is required will be simulated to demonstrate that a pair of diesel generators will start, accelerate, force parallel, and accept the emergency loads in the prescribed sequence."

2. Page 222, TS 4.9.E.3, add footnote 1 and revise the current TS wording to the following:

   "Once every 24 months, during shutdown, each station battery shall be subjected to a service (duty cycle) test.[1]"

   Added footnote 1 reads:

   "[1] A modified performance test may be performed in lieu of the battery service test."

3. Page 222, TS 4.9.E.4, revise the current TS wording to the following:

   "Once every 60 months, during shutdown, each battery shall be subjected to a performance test (or modified performance test). This test shall verify that the battery capacity is at least 80% of the manufacturer's rating."

4. Page 222, incorporate new TS 4.9.E.5 as follows:

   "Accelerated performance testing (or modified performance test) shall be conducted on any battery:

   a) Annually if capacity drops more than 10% from its previous performance test (or modified performance test).

   b) Annually if capacity is below 90% of manufacturer's rating

   c) Annually if it has reached 85% of its service life with capacity < 100% of manufacturer's rating."

   d) Once every 24 months if it has reached 85% of its service life with capacity ≥100% of the manufacturer's rating."

5. Page 222, change current TS 4.9.E.5 to TS 4.9.E.6 and revise "each operating cycle not to exceed 18 months" to "once every 24 months." The revised TS reads:

   "Each battery charger shall be visually inspected weekly and a performance test conducted once every 24 months."

6. Page 222, revise current TS 4.9.E.6 to 4.9.E.7 (no text changes).

7. Page 222a, TS 4.9.F.3, add footnote 1 and revise the current TS wording to the following:

   "Once every 24 months each battery shall be subjected to a service (duty cycle) test.[1]"

   Added footnote 1 reads:

   "[1] A modified performance test may be performed in lieu of the battery service test."

8. Page 222a, TS 4.9.F.4, revise the current TS wording to the following:

   "Once every 60 months each battery shall be subjected to a performance test (or modified performance test). This test shall verify that the battery capacity is at least 80% of the manufacturer's rating."

9. Page 222b, incorporate new TS 4.9.F.5 as follows:

   "Accelerated performance testing (or modified performance test) shall be conducted on any battery:

   a) Annually if capacity drops more than 10% from its previous performance test (or modified performance test).

   b) Annually if capacity is below 90% of manufacturer's rating

   c) Annually if it has reached 85% of its service life with capacity <100% of manufacturer's rating.

   d) Once every 24 months if it has reached 85% of its service life with capacity ≥100% of the manufacturer's rating."

10. Page 222a, change current TS 4.9.F.5 to TS 4.9.F.6 and revise "each operating cycle not to exceed 18 months" to "once every 24 months." (This revision results in the TS being moved to page 222b) The revised TS reads:

    "Each battery charger and inverter shall be visually inspected weekly and a performance test conducted once every 24 months."

11. Page 222a, revise current TS 4.9.F.6 to 4.9.F.7 (no text changes). (This revision results in the TS being moved to page 222b).

12. Page 226, Bases 4.9.E, Battery System, revise to reflect use of the revised IEEE-450-1995. The revised bases reads:

    "Performance and service tests are conducted in accordance with the recommendations of IEEE-450-1995.

13. Page 226, Bases 4.9.E, Battery System, incorporate the following:

    "The battery service (duty cycle) test demonstrates the capacity of the battery to meet the system design requirements. When a service test is used on a regular basis, it will reflect maintenance practices. The FitzPatrick design duty cycle loads are determined by a LOCA concurrent with a loss of normal and reserve power.

    The performance (discharge) test is a test of the constant current capacity of a battery and can be conducted with the battery in an as-found condition after being subjected to an equalizing charge. If performance testing is to be used to reflect baseline battery trending capacity, then special conditions (including equalizing) are required to establish the battery in an as-known condition prior to the test. If performance testing is to be used to reflect maintenance practices as well as trending, the equalizing charge can be omitted.

    The modified performance test is a composite test which envelopes both the service test and performance test requirements. The modified performance test discharge current envelopes the peak duty cycle loads of the service test followed by a constant discharge current (temperature corrected) for the performance test.

    The purpose of the modified performance test is to demonstrate the battery has sufficient capacity to meet the system design requirements and to provide trendable performance data to compare the available capacity in the battery to previous capacity test results. The modified performance test may be performed in lieu of the battery service test.

    The station batteries are required for plant operation, and performing the station battery service test and performance (or modified performance) test requires the reactor to be shut down."

14. Page 226, Bases 4.9.F, LPCI MOV Independent Power Supply, revise to reflect use of the revised IEEE-450-1995. The revised bases reads:

    "Performance and service tests are conducted in accordance with the recommendations of IEEE-450-1995.

2.2.1 Emergency A.C. Power System, TS 4.9.B.4

The surveillances associated with TS 4.9.B.4 include the following:

1) The Emergency AC Power Load Sequencing Test and 4 kV Emergency Power System Voltage Relays Instrument Functional Test.

2) The LOCA Bypass of EDG Shutdown Logic Functional Test.

The Emergency AC Power Load Sequencing Test and 4kV Emergency Power System Voltage Relays Instrument Functional Test verifies that each pair of Emergency Diesel Generators (EDGs) will start, accelerate, force parallel and accept emergency loads in the prescribed sequence under conditions that simulate those requiring the EDG system. The surveillance test data reviewed from 1987 to 1995 produced the following results:

a) A test, dated 4/18/87, indicated the "B" core spray timer required readjustment (i.e., initially failing this portion of test), before successfully completing the surveillance test.

b) Tests performed in 1988 and in 1990 passed all portions of this surveillance test.

c) In 1992, a portion of the test failed initially, was then retested, and passed the test.

d) The test performed in 1993 and 1995 passed all portions of the surveillance test.

The test failures of 1987 and 1992 were associated with the ECCS pump sequencing timers. The requirement to test these timers as a part of the Emergency AC Power Load Sequencing Test and 4kV Emergency Power System Voltage Relays Instrument Functional Test has been removed from the test. These timers are tested on a frequency of once every six months during logic system functional testing. The test method has also been improved by use of electronic test equipment. The testing frequency for the Emergency AC Power Load Sequencing Test and 4kV Emergency Power System Voltage Relays Instrument Functional Test can be safely extended to 24 months because the portion of the testing that caused the failures in 1987 and 1992 is tested once every six months and, therefore, is not affected by an increase in operating cycle length. Potential EDG operability problems are detected by monthly on-line testing (which includes EDG full load testing and system instrumentation check).

Based on the above discussion of this surveillance test history, the testing interval for this surveillance test can be safely extended to accommodate a 24-month operating cycle.

The second plant surveillance test associated with TS 4.9.B.4 is the LOCA Bypass of EDG Shutdown Logic Functional Test, which verifies that low lube oil pressure and high circulating water temperature do not shut down the EDG when the EDG is started under accident conditions. With an EDG running, an EDG

shutdown logic circuit lead is lifted to simulate LOCA signals. Low lube oil pressure switch and high jacket water temperature switch contacts are jumpered to simulate engine shutdown signals. Continued EDG operation demonstrates LOCA bypass of these shutdown signals. When both LOCA relays have been tested, the lifted lead is installed with the shutdown signal still applied, demonstrating proper shutdown logic function.

The LOCA bypass of EDG shutdown logic functional test can be safely extended to accommodate a 24-month operating cycle because the review of past surveillance tests performed from 1987 to 1995 indicates that the test results were satisfactory with no corrective actions required.

On-line testing adequately demonstrates system operability and past equipment performance has not affected the safety system functions. Therefore, based on the associated surveillance tests for TS 4.9.B.4 discussed above, this TS surveillance test interval can be safely extended to accommodate a 24-month operating cycle.

2.2.2 Station Batteries, TS 4.9.E

The surveillance associated with current TSs 4.9.E.3 and 4.9.E.5 is the 125V DC Station Battery Service and Charger Performance Test. IEEE 450-1995 provides recommended maintenance practices and testing procedures that can be used to optimize the life and performance of large lead-acid storage batteries. It also provides guidance for determining when batteries should be replaced. These practices and guidance are incorporated into the appropriate plant procedures at FitzPatrick. In addition to extending the surveillance intervals for service testing and battery charger testing to 24 months, new commitments are proposed for modified performance testing (TSs 4.9.E.4 and 4.9.F.4) and accelerated testing (TSs 4.9.E.5 and 4.9.F.5) for station and Low Pressure Coolant Injection (LPCI) Independent Power Supply (IPS) batteries, the latter invoked when the batteries show degradation or are approaching the end of their rated service life.

The service test is a test of the battery's ability to satisfy the duty cycle design requirements. The performance test is a test of the constant current capacity of a battery which is performed to detect any change in the battery capacity and provide battery performance trending data. This test is intended to determine overall battery degradation due to age and usage. The purpose of a modified performance test is to compare the capacity of the battery against the manufacturers specified capacity and thereby determine when the battery is approaching the end of its life and to verify the battery can perform its intended safety function. The modified performance test is a composite test which consists of a peak load equivalent to that of the service test and a constant discharge current of the performance test for the remainder of the test which envelopes the next highest load value of the service test. The modified performance test may be performed in lieu of the service test required by TS 4.9.E.3 at any time because the modified performance test bounds both the service and performance tests. The implementation of this single test increases the availability of the respective batteries because of reduced time required for testing and charging, provided the acceptance criteria are met. Use of the modified performance test is consistent with the

recommendations of IEEE-450-1995. Based on the above, the use of the modified performance test is acceptable.

The proposed requirements for battery testing are consistent with those stipulated in IEEE Standard 450-1995. The performance or modified performance testing of TS 4.9.E.4, in conjunction with the other requirements in TS 4.9.E, provide a high level of confidence that the condition of the station batteries will be detected prior to degradation leading to battery inoperability.

Potential station battery and charger operability problems would be detected by the following combination of on-line tests and inspections:

(a) Every week the specific gravity, voltage and temperature of the pilot cell and overall battery voltage is measured.

(b) The 125V DC system is also subjected weekly to visual inspections and tests for cracked cells or electrolyte leakage, corrosion at either terminals or connectors, electrolyte level within the level markings on the jars, and the proper battery charger current and voltage output. A weekly battery charger visual inspection is also required by TSs.

(c) A quarterly station battery surveillance test measures the voltage of each cell to the nearest 0.01V, the specific gravity of each cell, and the temperature of every fifth cell.

(d) "Accelerated performance testing (or modified performance test) shall be conducted on any battery:

    a) Annually if capacity drops more than 10% from its previous performance test (or modified performance test).

    b) Annually if capacity is below 90% of manufacturer's rating

    c) Annually if it has reached 85% of its service life with capacity ≤100% of manufacturer's rating.

    d) Once every 24 months if it has reached 85% of its service life with capacity ≥100% of the manufacturer's rating."

Thus, adequate on-line surveillance testing and maintenance programs are in place to ensure that the station batteries and their associated chargers are functioning properly. This extensive on-line testing program establishes the operability of the batteries while testing performed during each refueling outage demonstrates the battery's ability to meet the design requirements of the system.

The 125V DC station battery service and charger performance surveillance test required by current TSs 4.9.E.3 and 4.9.E.5 can be safely extended to accommodate a 24-month operating cycle because:

1) Service and performance testing of battery capability is consistent with the recommendations of IEEE 450-1995.

2) On-line testing provides adequate assurances that station battery and charger performance problems would be detected through the weekly, quarterly and annual surveillances, if certain conditions exist.

3) A review of previous discharge tests up through 1995 indicate that the acceptance criteria has always been satisfied for this test.

4) Computer trending of the specific gravity of the individual cells should indicate potential problems with the battery.

Based on the associated surveillance tests for current TSs 4.9.E.3 and 4.9.E.5 discussed above, the proposed TS surveillance test intervals can be safely extended to accommodate a 24 month operating cycle.

Technical Specification 4.9.E.4 requires a performance test of the batteries at 5-year (i.e., 60-month) intervals. The frequency of this surveillance test requirement will not be changed to accommodate the 24-month operating cycle. It is proposed that the TS be revised to state that the performance test shall verify the battery capacity is at least 80% of the manufacturers rating. This acceptance criterion is consistent with the recommendations of IEEE-450-1995. A capacity of <80% shows that the rate of battery degradation is increasing, even if there is ample capacity to meet the load requirement.

New TS 4.9.E.5 proposes accelerated performance testing requirements for any battery that shows signs of degradation or has reached 85% of its service life. Degradation is indicated when battery capacity drops by more than 10% relative to its capacity on the previous performance test (or modified performance test), or when its capacity is below 90% of the manufacturers rating. If the battery shows degradation, or if it has reached 85% of its expected life and capacity is <100% of the manufacturers rating, the surveillance frequency is reduced to 12 months. However, if the battery shows no degradation but has reached 85% of its expected life, the surveillance frequency is only reduced to 24 months for batteries that retain capacity ≤100% of the manufacturers rating. These performance testing requirements are consistent with those stipulated in IEEE standard 450-1995, and are acceptable.

2.2.3 LPCI Station Batteries

The surveillance associated with current TSs 4.9.F.3 and 4.9.F.5 is the LPCI Battery Duty Cycle and Charger-Inverter Performance Surveillance Test. This test demonstrates operability of the Low Pressure Coolant Injection (LPCI) independent power supply battery by performance of a duty cycle test.

In the same manner as discussed above for the station batteries, new commitments for modified performance testing and accelerated performance testing for LPCI station batteries are proposed in TSs 4.9.F.3, 4.9.F.4, and 4.9.F.5. Surveillance intervals are revised to 24 months for the LPCI battery service test in TS 4.9.F.3 and the battery charger performance test (current TS 4.9.F.5, renumbered to 4.9.F.6). In addition, TS 4.9.F.3 has been revised to specify that a modified performance test may be performed in lieu of the battery service test.

This surveillance test can be safely extended to accommodate a 24-month operating cycle for the following reasons:

1) Service and performance testing is done in accordance with the recommendations of IEEE 450-1995.

2) On-line LPCI battery testing, performed weekly and quarterly, is adequate to detect any operability problems.

3) The review of previous discharge test results through 1995 indicated satisfactory test results with test failure exceptions limited to test equipment failure and incorrect acceptance criteria. (The actual performance and duty cycle test did not cause the test to be unsatisfactory).

4) Computer trending of the specific gravity of the individual cells should indicate potential problems with the battery.

Based on the associated surveillance tests for current TSs 4.9.F.3 and 4.9.F.5 discussed above, this TS surveillance test interval can be safely extended to accommodate a 24 month operating cycle.

Technical Specification 4.9.F.4 requires a performance test of the LPCI batteries at 5-year (i.e., 60-month) intervals. The frequency of this surveillance test requirement will not be changed to accommodate the 24-month operating cycle. It is proposed that the TS be revised to state that the performance test shall verify the battery capacity is at least 80% of the manufacturers rating. This acceptance criterion are consistent with the recommendations of IEEE-450-1995. A capacity of <80% shows that the battery rate of degradation is increasing, even if there is ample capacity to meet the load requirement.

New TS 4.9.E.5 proposes accelerated performance testing requirements for any LPCI battery that shows signs of degradation or has reached 85% of its service life. Degradation is indicated when battery capacity drops by more than 10% relative to its capacity on the previous performance test (or modified performance test), or when its capacity is below 90% of the manufacturers rating. If the battery shows degradation, or if it has reached 85% of its expected life and capacity is <100% of the manufacturers rating, the surveillance frequency is reduced to 12 months. However, if the battery shows no degradation but has reached 85% of its expected life, the surveillance frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturers rating. These performance testing requirements are consistent with those stipulated in IEEE standard 450-1995.

On-line testing adequately demonstrates system operability and past equipment performance has not affected the LPCI safety system functions. Therefore, based on the associated LPCI battery surveillance tests discussed above, the LPCI battery TS surveillance test intervals can be safely extended to accommodate a 24 month operating cycle.

The proposed TSs 4.9.E.4 and 4.9.F.4 use the term "performance test" and "modified performance test." However, the bases are clarified to note that these represent discharge tests.

Based on the above discussions, the NRC staff finds the proposed changes to TS Sections 4.9.B, 4.9.E, 4.9.F, and their associated Bases, acceptable.

2.3 Containment Systems

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 such that off-site doses from a postulated design basis accident (DBA) are below the guideline values of 10 CFR Part 100. The containment systems at FitzPatrick consist of the Primary and Secondary Containment and their support systems.

The proposed changes to the containment system TSs are as follows:

1. Page 165, TS 4.7.A.1, change the inspection of the drywell accessible interior surfaces from "each operating cycle" to "once per 24 months." The revised TS 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, TS 4.7.A.5.c, change the visual inspection of the vacuum breaker valves from "each operating cycle" to "per 24 months." The revised TS reads:

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

3. Page 178, TS 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 TS 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, TS 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 TS 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 TS 3.7.A.5.f and each vacuum breaker shall be inspected and verified to meet design requirements."

5. Page 181, TS 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 TS reads:

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

6. Page 182, TS 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 TS reads:

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

7. Page 183, TS 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 TS reads:

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

8. Page 185, TS 4.7.C.1.c, change this surveillance interval from "at each refueling outage" to "once per 24 months." The revised TS 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, TS 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 TS 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, TS 4.7.D.1.b, delete footnote indicated by "*" in TS 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 TS 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 cf power operated and automatically initiated primary containment isolation valves."

2.3.1 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-waterline of the torus are inspected for evidence of deterioration such as scaling, rusting, 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. 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.

2.3.2 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 ensure 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 0.5 psid. 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. Based on existing on-line functional testing, this surveillance interval can be safely extended to accommodate a longer operating cycle.

2.3.3 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 to possible bypass leakage. This condition would be investigated and appropriate corrective actions taken.

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.

2.3.4 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 ensure 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 elements 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 with the heating requirement provides enough margin so that minor degradation can be accommodated.

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.

2.3.5 SGT System Simulated Automatic Initiation (SR 4.7.B.1.d)

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. This surveillance can be safely extended since system instrumentation and mechanical components are tested periodically on-line.

2.3.6 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. 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.

2.3.7 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 ≤ 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 SGT 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 are 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. 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 are sufficient administrative controls of work on secondary containment penetrations.

2.3.8 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 so that calculated DBA doses are well below the guidelines of 10 CFR Part 100.

In accordance with the guidance provided by Generic Letter 91-04, the licensee confirmed that historical maintenance and surveillance data supports the change in surveillance intervals to accommodate a 24-month fuel cycle. The licensee's review was documented in NYPA document JAF-RPT-MULTI-0116, "Containment Systems Surveillance Test Extensions," dated September 1, 1995, and NYPA document JSED-95-0395, "Supplementary Data for Surveillance Test Extension Evaluation," dated October 13, 1995.

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 that 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. In accordance with the guidance provided by Generic Letter 91-04, the licensee confirmed that historical maintenance and surveillance data supports the change in surveillance intervals to accommodate a 24-month fuel cycle. The licensee's review was documented in NYPA document JAF-RPT-MULTI-0116, "Containment Systems Surveillance Test Extensions," dated September 1, 1995, and NYPA document JSED-95-0395, "Supplementary Data for Surveillance Test Extension Evaluation," dated October 13, 1995. 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.

2.3.9 TS Bases Changes

The proposed Bases changes on TS page 195 modifies 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 TS Bases and was representative of a 12 month operating cycle. The methodology used to derive this value was contained in the TS 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 TSs. This statement was overlooked during the development of Amendment No. 227, and should have been deleted.

Based on the above discussions, the NRC staff finds the proposed changes to TS Sections 4.7.A, 4.7.B, 4.7.C, 4.7.D, and their associated Bases, acceptable.

2.4 Standby Liquid Control System Changes

The design objective of the SLC system is to provide a backup method, independent of the control rods, to bring and maintain the reactor subcritical from the most reactive condition as the reactor cools. The system would be used in the unlikely event that a sufficient number of control rods could not be inserted into the core to accomplish reactor shutdown in the normal manner. The system is sized to counteract the positive reactivity effect from a full power to a cold shutdown condition, at any time in core life, by the injection of high pressure borated water into the reactor vessel.

The proposed changes to the standby liquid control system TSs are as follows:

1. Page 105, TS 4.4.A.1, delete "At least" to make the terminology in this section consistent.

   The deletion of "At least" will change the frequency of the surveillance and has not been technically justified. Therefore, this change is unacceptable.

2. Page 105 and 106, TS 4.4.A.2, change from "during each operating cycle" to "per 24 months." The revised TS reads:

   "2. Once per 24 months

   Manually initiate the system, except the explosive valves. Pump solution through the recirculation path.

   Explode one of three primer assemblies manufactured in the same batch to verify proper function. Then install the two remaining primer assemblies of the same batch in the explosive valves.

   Demineralized water shall be injected into the reactor vessel to test that valves (except explosive valves) not checked by the recirculation test are not clogged.

   Test that the setting of the system pressure relief valves is between 1,400 and 1,490 psig."

An editorial change is being made to move the words "pump solution in the recirculation path" from the top of page 106 to the bottom of page 105 to make the TS easier to read. The wording of the TS was changed to clarify the TS. These changes do not change the intent of TS 4.4.A.2.

3. Page 106, TS 4.4.A.3, add "Once per 24 months" to the beginning of the TS and change "in the course of two operating cycles" to "within two test intervals." The revised TS reads:

   "3. Once per 24 months -

   Disassemble and inspect one explosive valve so that it can be established that the valve is not clogged. Both valves shall be inspected within two test intervals."

4. Page 107, TS 4.4.C.1, delete "At least" to make the terminology in this section consistent.

   The deletion of "At least" will change the frequency of the surveillance and has not been technically justified. Therefore, this change is unacceptable.

5. Page 107, TS 4.4.C.2, delete "At least" to make the terminology in this section consistent.

   The deletion of "At least" will change the frequency of the surveillance and has not been technically justified. Therefore, this change is unacceptable.

6. Page 107, current TS 4.4.C.3.a, change "per operating cycle" to "at least per 18 months." The numbering of the TS will change to 4.4.C.3 because the current TS 4.4.C.3.b will be changed as described below. The revised TS reads:

   "3. At least once per 18 months

   The temperature and level elements shall be calibrated."

7. Page 107, current TS 4.4.C.3.b, renumber TS to 4.4.C.4 and revise the TS to "Once per 24 months." The revised TS reads:

   "4. Once per 24 months

   Enrichment of B-10 (in atom percent) shall be checked."

8. Bases page 109, second sentence of the fourth paragraph in the first column, change "each refueling outage" to "every 24 months." The revised text reads:

   "Because components in the system are checked periodically as described above, a functional test of the entire system on a frequency of more than once every 24 months is unnecessary."

9. Bases page 109a, last sentence of the second paragraph, change "per operating cycle" to "every 24 months." The revised text reads:

   "Therefore, a check once every 24 months is adequate to ensure proper enrichment."

2.4.1 Surveillance Requirement 4.4.A.2

This SR requires that the following once-per-cycle testing be performed on the SLC system to verify operability:

1. *Manually initiate the system, except for the explosive valves, and pump solution in the recirculation path.*

   During the performance of this test, each SLC pump is operated to pump solution from the SLC storage tank through the test line and back into the storage tank. This test verifies that the piping between the SLC storage tank and the pump inlets is not blocked. A potential source of blockage is the precipitation of sodium pentaborate in the tank and suction piping. This is avoided by maintaining temperature of the tank and suction piping at least 10°F above saturation temperature for the concentration of the solution by use of tank heaters and heat tracing on the pump suction lines. These heating systems, along with TS required daily checks of tank temperature, ensure that sodium pentaborate remains in solution and does not result in blockage of the flowpath. In addition, a review of surveillance test results from 1983 to 1995 shows no failures.

2. *Explode one of three primer assemblies manufactured in the same batch to verify proper function. Then install the two remaining primer assemblies of the same batch in the explosive valves.*

   The purpose of this test is to establish that the valve explosive charge will function properly. The system utilizes two squib activated shear explosive valves in parallel as a means of isolating both pumps from the reactor vessel. The valves are maintained in the closed position and are activated only in an emergency to provide a flow path to the reactor vessel. The firing circuit continuity for each valve is continuously monitored by pilot lights, ammeters, and an annunciator signaling loss of continuity in the control room to alert plant control room operators of any problems with the circuit. The proposed testing interval of 24 months (+25 percent) is within the manufacturers recommended service life for the explosive charges. Evaluation of surveillance test results from 1983 to 1995 shows no test failures.

   During the 1992 performance of this surveillance, the testing was stopped because it was noticed that the squib valve continuity circuit was not functioning properly. Upon investigation, several electronic components were found to be defective. The test was completed following repair of these components and the explosive charges functioned properly. Further investigation into the cause of these component

failures led to implementation of a modification to install surge suppression varistors to protect the squib valve continuity circuit electronics. These failures do not preclude extension of this surveillance interval because the failed components are outside the scope of this surveillance requirement and would not have prevented the squib valves from operating.

3. *Demineralized water shall be injected into the reactor to test that valves (except explosive valves) not checked by the recirculation test are not clogged.*

   The SLC system is remote manually initiated from the main control room to demonstrate the capability of the SLC system to inject demineralized water into the reactor vessel. The firing of the explosive valves is simulated and the system pumps and valves are flushed with demineralized water prior to the test to preclude entry of sodium pentaborate solution into the reactor vessel. The pumps and valves in the flow path, up to the injection valves, are tested monthly. The only practical time to test the injection portion of the system is during plant shutdown for refueling. Evaluation of surveillance test results from 1983 to 1995 has identified no test failures.

4. *Test that the setting of the system pressure relief valves is between 1400 and 1490 psig.*

   This test demonstrates that the SLC pump discharge safety valves lift between 1400 and 1490 psig. These valves protect the system from overpressure. The valves are only used and pressurized during brief periods for system testing. Therefore, the possibility of valve degradation is very low. The SLC system is designed with two redundant loops. If one relief valve lifted at too low a pressure, the check valve in that discharge line would prevent the other pump flow from recycling back to the storage tank. Relief valve failure due to setpoint drift in the low direction would be detected during monthly and quarterly pump testing. The proposed 24-month testing frequency is more frequent than the American Society of Mechanical Engineers (ASME) Section XI testing requirements for relief valves. The current edition of the ASME code for the FitzPatrick Plant (1980 Edition through 1981 Winter Addenda) requires testing of this type of valve at five year intervals. Surveillance test results from 1983 to 1995 identified no test failures.

Based on a review of past surveillance history, on-line testing performed on major SLC system components, and engineering evaluation that the longer operating cycle length will not increase the probability of test failure, extension of this surveillance requirement to support a 24-month operating cycle is acceptable.

2.4.2 Surveillance Requirement 4.4.A.3

This surveillance requires disassembly and inspection of the internals of one explosive valve so that it can be established that the valve is not clogged. Both valves are inspected in the course of two operating cycles. The valves are normally in a standby condition and are not operated except to provide a flowpath for borated water into the reactor vessel or for testing on a refueling outage basis. Due to the limited use of the valves, they are not likely to wear out due to fatigue. Therefore, the operating cycle length does not have a significant impact on maintenance requirements. An evaluation of surveillance test data from 1990 to 1995 indicates that the test results have always been within the acceptance criteria. Based on past surveillance history and the limited use of these valves, extending this test to a 24 month interval will not significantly increase the probability of test failure.

2.4.3 Surveillance Requirement 4.4.C.3 (Current TS 4.4.C.3.a)

This surveillance requires that the temperature and level elements associated with the sodium pentaborate storage tank and pump suction piping be calibrated once per operating cycle. The solution is maintained at least 10°F above the solution saturation temperature by a tank heater and a piping heat tracing system. This prevents the precipitation of sodium pentaborate in the storage tank and pump suction lines. Temperature indication and alarms for the system annunciate in the control room. Temperature is checked daily and an acceptable result provides assurance that the system is maintained as required by TSs. Level instrumentation is provided for the sodium pentaborate storage tank. Monitoring of tank level and level alarms are used to detect whether the solution volume has changed, which may be indicative of a solution concentration change. Tank level is checked daily, as required by TSs, using two independent means. These daily checks will detect instrument drift or level changes due to water addition, water evaporation, or system leaks.

An evaluation of past calibration data for the temperature instrumentation does not support extension of the calibration frequency to support a 24-month operating cycle. Based on operating history, temperature instrumentation drift will most likely result in alarms. Further investigation of these alarms will reveal the need for instrument calibrations. Temperature instrumentation is capable of being calibrated while the unit is at power. Because the calibration frequency of 18 months is not cycle length or refueling outage dependant. Therefore, keeping this calibration on an 18-month frequency will not be a burden on plant operation or plant personnel.

An evaluation of past calibration data for the sodium pentaborate tank level instrumentation does not support extension of the calibration frequency to support a 24-month operating cycle. Based on past operating history, level instrument drift problems will most likely result in alarms which will alert plant personnel to verify the actual tank level. The level instruments are capable of being calibrated while the unit is at power. As such, the calibration frequency of 18 months is not cycle length or refueling outage dependent. Therefore, keeping the level calibration on an 18-month frequency will not be a burden on plant operation or plant personnel.

Based on the discussion above, the temperature and level calibration required by TS 4.4.C.3 shall remain on an 18-month frequency.

2.4.4 TS Surveillance 4.4.C.4 (Current TS 4.4.C.3.b)

This surveillance requires that the enrichment of the Boron-10 (B-10) in atom percent in the sodium pentaborate solution be checked once per operating cycle. The minimum enrichment is 34.7 atom percent of B-10. The SLC boron concentration is checked by chemical analysis monthly, any time water or enriched sodium pentaborate is added, or if the solution temperature drops below TS limits. Once the solution is prepared in the tank, the concentration of boron will not lower unless more boron or water is added. Level indications and alarms are used to detect whether the solution volume has changed, which might be indicative of a solution concentration change. Boron enrichment in atom percent will not vary with the addition of enriched sodium pentaborate material or water to the SLC tank provided that 34.7 percent enriched (B-10 atom percent) is added. Therefore, the check of boron enrichment in atom percent is not affected by the longer operating cycle.

Based on the above information, the once per operating cycle check of boron enrichment in atom percent can safely be extended to support a 24-month operating cycle.

2.4.5 Antipated Transient Without Scram (ATWS) Rule (10 CFR 50.62(c)(4)) Commitments

The commitments regarding conformance of the SLC system to the ATWS rule were reviewed to ensure the increased surveillance interval of 24 months would not invalidate those commitments. The ATWS rule requires that the SLC system have a minimum equivalent control capacity of 86 gallons per minute (gpm) of 13 weight percent sodium pentaborate solution. This equivalent control capacity is met by increasing boron-10 enrichment to 34.7 atom percent and taking credit for a 50 gpm pumping capacity of the SLC pumps. The final in-vessel boron concentration following injection of SLC solution was increased from 600 ppm of natural boron to 660 ppm of equivalent natural boron. This additional margin was used to permit increases in core reload enrichment and energy content in future reload core designs.

The proposed changes to TSs do not change the commitments related to the minimum equivalent control capacity of the SLC system because boron-10 enrichment will continue to be maintained at the minimum required enrichment. The capacity of the SLC pumps is verified once per month to be $\geq$ 50 gpm, therefore this commitment is not affected by the longer operating cycle. The affect of the longer operating cycle on the 660 ppm acceptance criteria has been evaluated by General Electric. The evaluation shows that 660 ppm is adequate to shutdown the reactor for an equilibrium, uprated core loaded for a 24-month cycle. Therefore, the proposed increase in surveillance frequency will not adversely affect the final in-vessel boron concentration following injection of the SLC solution.

Based on the above discussions, the NRC staff finds the proposed changes to TS Sections 4.4.A.1, 4.4.A.2, 4.4.A.3, 4.4.C.3.a, 4.4.C.3.b, and their associated Bases, acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New York State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (60 FR 47623, 61 FR 1633, 61 FR 1634 and 61 FR 1635). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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