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

August 31, 2010

Vice President, Operations
Entergy Operations, Inc.
River Bend Station
5485 U.S. Highway 61N
St. Francisville, LA 70775

SUBJECT: RIVER BEND STATION, UNIT 1 - ISSUANCE OF AMENDMENT RE: REVISE TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENT FREQUENCIES FROM 18- TO 24-MONTH FUEL CYCLE INTERVALS (TAC NO. ME1872)

Dear Sir or Madam:

The Commission has issued the enclosed Amendment No. 168 to Facility Operating License No. NPF-47 for the River Bend Station, Unit 1 (RBS). The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated August 10, 2009, as supplemented by letters dated December 8, 2009, and April 22, June 16, and August 17, 2010, and three e-mails dated June 29, July 12, and July 28, 2010.

The amendment revises the TSs for the RBS to support operation with 24-month fuel cycles. Specifically, the change would revise the frequency of certain TS Surveillance Requirements (SRs) from "18 months" to "24 months," in accordance with the guidance of Generic Letter (GL) 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle." Consistent with the GL, changes were made to the Administrative Controls Section 5.5.7, "Ventilation Filter Testing Program (VFTP)," to address changes to 18-month frequencies that are specified in Regulatory Guide (RG) 1.52, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," and Section 5.5.14, "Control Room Envelope Habitability Program," to address changes to 18-month frequencies that are specified in RG 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors." Also, the standby liquid control available Boron-10 weight (TS 3.1.7) was changed.

By letter dated June 16, 2010, Entergy withdrew its proposed changes to TS 3.3.8 regarding the change to the degraded voltage instrumentation allowable values as indicated on Table 3.3.8.1-1 and to extend SRs 3.3.8.1.3 and 3.3.8.1.4 from 18 to 24 months. By letter dated August 17, 2010, Entergy withdrew the request for not revising SR 3.3.8.1.4 and requested that this SR be extended as originally requested.

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

Sincerely,

Alan Wang

Alan B. Wang, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-458

Enclosures:
1. Amendment No. 168 to NPF-47
2. Safety Evaluation

cc w/encls: Distribution via Listserv

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

ENTERGY GULF STATES LOUISIANA, LLC

AND

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-458

RIVER BEND STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 168
License No. NPF-47

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

   A. The application for amendment by Entergy Operations, Inc. (the licensee), dated August 10, 2009, as supplemented by letters dated December 8, 2009, and April 22, June 16, and August 17, 2010, and e-mails dated June 29, July 12, and July 28, 2010, 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, as amended, 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 license 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. NPF-47 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 168 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. EOI shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and shall be implemented no later than the end of the next refueling outage (scheduled to begin in January 2011).

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Facility Operating
License No. NPF-47 and
Technical Specifications

Date of Issuance: August 31, 2010

ATTACHMENT TO LICENSE AMENDMENT NO. 168

FACILITY OPERATING LICENSE NO. NPF-47

DOCKET NO. 50-458

Replace the following pages of the Facility Operating License No. NPF-47 and Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by Amendment number and contain marginal lines indicating the areas of change.

Facility Operating License

| Remove | Insert |
|---|---|
| 3 | 3 |

Technical Specifications

| Remove | Insert |
|---|---|
| 3.1-22 | 3.1-22 |
| 3.1-25 | 3.1-25 |
| 3.3-5 | 3.3-5 |
| 3.3-6 | 3.3-6 |
| 3.3-13 | 3.3-13 |
| 3.3-17 | 3.3-17 |
| 3.3-21 | 3.3-21 |
| 3.3-24 | 3.3-24 |
| 3.3-27 | 3.3-27 |
| 3.3-28 | 3.3-28 |
| 3.3-31 | 3.3-31 |
| 3.3-38 | 3.3-38 |
| 3.3-46 | 3.3-46 |
| 3.3-52 | 3.3-52 |
| 3.3-60 | 3.3-60 |
| 3.3-64 | 3.3-64 |
| 3.3-67 | 3.3-67 |
| 3.3-70 | 3.3-70 |
| 3.3-73 | 3.3-73 |
| 3.3-77 | 3.3-77 |
| 3.4-6 | 3.4-6 |
| 3.4-7 | 3.4-7 |
| 3.4-11 | 3.4-11 |
| 3.4-19 | 3.4-19 |
| 3.5-5 | 3.5-5 |
| 3.5-9 | 3.5-9 |
| 3.5-11 | 3.5-11 |
| 3.5-12 | 3.5-12 |

| | |
|---|---|
| 3.6-8 | 3.6-8 |
| 3.6-17 | 3.6-17 |
| 3.6-18 | 3.6-18 |
| 3.6-24 | 3.6-24 |
| 3.6-26 | 3.6-26 |
| 3.6-30 | 3.6-30 |
| 3.6-42 | 3.6-42 |
| 3.6-43 | 3.6-43 |
| 3.6-45 | 3.6-45 |
| 3.6-47 | 3.6-47 |
| 3.6-50 | 3.6-50 |
| 3.6-52 | 3.6-52 |
| 3.6-59 | 3.6-59 |
| 3.6-60 | 3.6-60 |
| 3.6-66 | 3.6-66 |
| 3.6-70 | 3.6-70 |
| 3.7-4 | 3.7-4 |
| 3.7-7 | 3.7-7 |
| 3.7-11 | 3.7-11 |
| 3.7-14a | 3.7-14a |
| 3.8-7 | 3.8-7 |
| 3.8-8 | 3.8-8 |
| 3.8-9 | 3.8-9 |
| 3.8-10 | 3.8-10 |
| 3.8-11 | 3.8-11 |
| 3.8-12 | 3.8-12 |
| 3.8-13 | 3.8-13 |
| 3.8-14 | 3.8-14 |
| 3.8-25 | 3.8-25 |
| 3.8-26 | 3.8-26 |
| 5.0-11 | 5.0-11 |
| 5.0-16a | 5.0-16a |

(3) EOI, pursuant to the Act and 10 CFR Part 70, to receive, possess and to use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;

(4) EOI, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(5) EOI, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(6) EOI, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

EOI is authorized to operate the facility at reactor core power levels not in excess of 3091 megawatts thermal (100% rated power) in accordance with the conditions specified herein. The items identified in Attachment 1 to this license shall be completed as specified. Attachment 1 is hereby incorporated into this license.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 168 and the Environmental Protection Plan contained in Appendix 8, are hereby incorporated in the license. EOI shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.7.5 | Verify the available weight of Boron-10 is ≥ 170 lbs, and the percent weight concentration of sodium pentaborate in solution is ≤ 9.5% by weight, and determine the minimum required available solution volume. | 31 days<br><br>AND<br><br>Once within 24 hours after water or boron is added to solution<br><br>AND<br><br>Once within 24 hours after solution temperature is restored to ≥ 45°F |
| SR 3.1.7.6 | Verify each SLC subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, is in the correct position, or can be aligned to the correct position. | 31 days |
| SR 3.1.7.7 | Verify each pump develops a flow rate ≥ 41.2 gpm at a discharge pressure ≥ 1250 psig. | In accordance with the Inservice Testing Program |
| SR 3.1.7.8 | Verify flow through one SLC subsystem from pump into reactor pressure vessel. | 24 months on a STAGGERED TEST BASIS |

(continued)

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.8.1 | ----------NOTE----------<br>Not required to be met on vent and drain valves closed during performance of SR 3.1.8.2.<br>----------<br><br>Verify each SDV vent and drain valve is open. | 31 days |
| SR 3.1.8.2 | Cycle each SDV vent and drain valve to the fully closed and fully open position. | 92 days |
| SR 3.1.8.3 | Verify each SDV vent and drain valve:<br><br>a. Closes in ≤ 30 seconds after receipt of an actual or simulated scram signal; and<br><br>b. Opens when the actual or simulated scram signal is reset. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.10 | Calibrate the trip units. | 92 days |
| SR 3.3.1.1.11 | ----------NOTES----------<br>1. Neutron detectors and flow reference transmitters are excluded.<br>2. For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.<br>3. For Function 2.b. the digital components of the flow control trip reference cards are excluded.<br>----------<br>Perform CHANNEL CALIBRATION. | 184 days |
| SR 3.3.1.1.12 | Perform CHANNEL FUNCTIONAL TEST. | 24 months |
| SR 3.3.1.1.13 | ----------NOTES----------<br>1. Neutron detectors are excluded.<br>2. For IRMs, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.<br>----------<br>Perform CHANNEL CALIBRATION. | 24 months |
| SR 3.3.1.1.14 | Verify the APRM Flow Biased Simulated Thermal Power–High time constant is within the limits specified in the COLR. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.15 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | 24 months |
| SR 3.3.1.1.16 | Verify Turbine Stop Valve Closure and Turbine Control Valve Fast Closure Trip Oil Pressure–Low Functions are not bypassed when THERMAL POWER is ≥ 40% RTP. | 24 months |
| SR 3.3.1.1.17 | Calibrate the flow reference transmitters. | 24 months |
| SR 3.3.1.1.18 | ----------NOTES----------<br>1. Neutron detectors are excluded.<br>2. For Functions 3, 4, and 5 in Table 3.3.1.1-1, the channel sensors are excluded.<br>3. For Function 6, "n" equals 4 channels for the purpose of determining the STAGGERED TEST BASIS Frequency.<br>----------<br>Verify the RPS RESPONSE TIME is within limits. | 24 months on a STAGGERED TEST BASIS |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.2.4 | ----------NOTE----------<br>Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant.<br>---<br>Verify count rate is:<br>a. ≥ 3.0 cps, or<br>b. ≥ 0.7 cps with a signal to noise ratio ≥ 2:1. | 12 hours during CORE ALTERATIONS<br>AND<br>24 hours |
| SR 3.3.1.2.5 | ----------NOTE----------<br>Not required to be performed until 12 hours after IRMs on Range 2 or below.<br>---<br>Perform CHANNEL FUNCTIONAL TEST. | 31 days |
| SR 3.3.1.2.6 | ----------NOTES----------<br>1. Neutron detectors are excluded.<br>2. Not required to be performed until 12 hours after IRMs on Range 2 or below.<br>---<br>Perform CHANNEL CALIBRATION. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.2.1.4 | ----------NOTE----------<br>Not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1.<br>----------<br>Perform CHANNEL FUNCTIONAL TEST. | 92 days |
| SR 3.3.2.1.5 | Calibrate the low power setpoint trip units. The Allowable Value shall be > 10% RTP and ≤ 35% RTP. | 92 days |
| SR 3.3.2.1.6 | Verify the RWL high power Function is not bypassed when THERMAL POWER is > 68.2% RTP. | 92 days |
| SR 3.3.2.1.7 | Perform CHANNEL CALIBRATION. | 184 days |
| SR 3.3.2.1.8 | ----------NOTE----------<br>Not required to be performed until 1 hour after reactor mode switch is in the shutdown position.<br>----------<br>Perform CHANNEL FUNCTIONAL TEST. | 24 months |
| SR 3.3.2.1.9 | Verify the bypassing and movement of control rods required to be bypassed in Rod Action Control System (RACS) is in conformance with applicable analyses by a second licensed operator or other qualified member of the technical staff. | Prior to and during the movement of control rods bypassed in RACS |

SURVEILLANCE REQUIREMENTS

----------NOTE----------
These SRs apply to each Function in Table 3.3.3.1-1.
---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.3.1.1 | Perform CHANNEL CHECK. | 31 days |
| SR 3.3.3.1.2 | Deleted | |
| SR 3.3.3.1.3 | Perform CHANNEL CALIBRATION. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.3.2.2 | Verify each required control circuit and transfer switch is capable of performing the intended functions. | 24 months |
| SR 3.3.3.2.3 | Perform CHANNEL CALIBRATION for each required instrumentation channel, except valve position instrumentation. | 24 months |

SURVEILLANCE REQUIREMENTS

----------NOTE----------
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains EOC-RPT trip capability.
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| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.4.1.1 | Perform CHANNEL FUNCTIONAL TEST. | 92 days |
| SR 3.3.4.1.2 | Calibrate the trip units. | 92 days |
| SR 3.3.4.1.3 | Perform CHANNEL CALIBRATION. The Allowable Values shall be:<br>a. TSV Closure: ≤ 7% closed.<br>b. TCV Fast Closure, Trip Oil Pressure — Low: ≥ 465 psig. | 24 months |
| SR 3.3.4.1.4 | Perform LOGIC SYSTEM FUNCTIONAL TEST, including breaker actuation. | 24 months |
| SR 3.3.4.1.5 | Verify TSV Closure and TCV Fast Closure, Trip Oil Pressure — Low Functions are not bypassed when THERMAL POWER is ≥ 40% RTP. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.4.1.6 | ----------NOTE----------<br>Breaker interruption time may be assumed from the most recent performance of SR 3.3.4.1.7.<br>----------<br>Verify the EOC-RPT SYSTEM RESPONSE TIME is within limits. | 24 months on a STAGGERED TEST BASIS |
| SR 3.3.4.1.7 | Determine RPT breaker interruption time. | 60 months |

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.4.2.2 | Perform CHANNEL FUNCTIONAL TEST. | 92 days |
| SR 3.3.4.2.3 | Calibrate the trip units. | 92 days |
| SR 3.3.4.2.4 | Perform CHANNEL CALIBRATION. The Allowable Values shall be:<br>a. Reactor Vessel Water Level–Low Low, Level 2: $\geq$ -47 inches; and<br>b. Reactor Steam Dome Pressure–High: $\leq$ 1165 psig. | 24 months |
| SR 3.3.4.2.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST, including breaker actuation. | 24 months |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.5.1-1 to determine which SRs apply for each ECCS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 3.c, 3.f, 3.g, and 3.h; and (b) for up to 6 hours for Functions other than 3.c, 3.f, 3.g, and 3.h, provided the associated Function or the redundant Function maintains ECCS initiation capability.

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| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.5.1.1 | Perform CHANNEL CHECK. | 12 hours |
| SR 3.3.5.1.2 | Perform CHANNEL FUNCTIONAL TEST. | 92 days |
| SR 3.3.5.1.3 | Calibrate the trip unit. | 92 days |
| SR 3.3.5.1.4 | Perform CHANNEL CALIBRATION. | 92 days |
| SR 3.3.5.1.5 | Perform CHANNEL CALIBRATION. | 24 months |
| SR 3.3.5.1.6 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | 24 months |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.5.2-1 to determine which SRs apply for each RCIC Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 2 and 5; and (b) for up to 6 hours for Functions 1, 3, and 4 provided the associated Function maintains RCIC initiation capability.

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| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.5.2.1 | Perform CHANNEL CHECK. | 12 hours |
| SR 3.3.5.2.2 | Perform CHANNEL FUNCTIONAL TEST. | 92 days |
| SR 3.3.5.2.3 | Calibrate the trip units. | 92 days |
| SR 3.3.5.2.4 | Perform CHANNEL CALIBRATION. | 24 months |
| SR 3.3.5.2.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | 24 months |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.6.1-1 to determine which SRs apply for each Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains isolation capability.

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| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.1.1 | Perform CHANNEL CHECK. | 12 hours |
| SR 3.3.6.1.2 | Perform CHANNEL FUNCTIONAL TEST. | 92 days |
| SR 3.3.6.1.3 | Calibrate the trip unit. | 92 days |
| SR 3.3.6.1.4 | Perform CHANNEL CALIBRATION. | 92 days |
| SR 3.3.6.1.5 | Perform CHANNEL CALIBRATION. | 24 months |
| SR 3.3.6.1.6 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | 24 months |
| SR 3.3.6.1.7 | ----------NOTE----------<br>Channel sensors are excluded.<br>---<br>Verify the ISOLATION SYSTEM RESPONSE TIME for the Main Steam Isolation Valves is within limits. | 24 months on a STAGGERED TEST BASIS |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.2.3 | Calibrate the trip unit. | 92 days |
| SR 3.3.6.2.4 | Perform CHANNEL CALIBRATION. | 24 months |
| SR 3.3.6.2.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | 24 months |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.6.3-1 to determine which SRs apply for each Containment Unit Cooler System Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains containment unit cooler initiation capability.

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| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.3.1 | Perform CHANNEL CHECK. | 24 hours |
| SR 3.3.6.3.2 | Perform CHANNEL FUNCTIONAL TEST. | 92 days |
| SR 3.3.6.3.3 | Calibrate the trip unit. | 92 days |
| SR 3.3.6.3.4 | Perform CHANNEL CALIBRATION. | 24 months |
| SR 3.3.6.3.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | 24 months |

SURVEILLANCE REQUIREMENTS

----------NOTE----------
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains LLS or relief initiation capability, as applicable.
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| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.4.1 | Perform CHANNEL FUNCTIONAL TEST. | 92 days |
| SR 3.3.6.4.2 | Calibrate the trip unit. | 92 days |
| SR 3.3.6.4.3 | Perform CHANNEL CALIBRATION. The Allowable Values shall be:<br>a. Relief Function<br>Low: 1133 ± 15 psig<br>Medium: 1143 ± 15 psig<br>High: 1153 ± 15 psig<br>b. LLS Function<br>Low open: 1063 ± 15 psig<br>close: 956 ± 15 psig<br>Medium open: 1103 ± 15 psig<br>close: 966 ± 15 psig<br>High open: 1143 ± 15 psig<br>close: 976 ± 15 psig | 24 months |
| SR 3.3.6.4.4 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | 24 months |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.7.1-1 to determine which SRs apply for each Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains CRFA initiation capability.

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| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.7.1.1 | Perform CHANNEL CHECK. | 12 hours |
| SR 3.3.7.1.2 | Perform CHANNEL FUNCTIONAL TEST. | 92 days |
| SR 3.3.7.1.3 | Calibrate the trip units. | 92 days |
| SR 3.3.7.1.4 | Perform CHANNEL CALIBRATION. | 24 months |
| SR 3.3.7.1.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | 24 months |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.8.1-1 to determine which SRs apply for each LOP Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 2 hours provided the associated Function maintains DG initiation capability.

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| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.8.1.1 | Perform CHANNEL CHECK. | 12 hours |
| SR 3.3.8.1.2 | Perform CHANNEL FUNCTIONAL TEST. | 31 days |
| SR 3.3.8.1.3 | Perform CHANNEL CALIBRATION. | 18 months |
| SR 3.3.8.1.4 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.8.2.2 | Perform CHANNEL CALIBRATION. The Allowable Values shall be:<br><br>a. Overvoltage<br><br>Bus A $\leq$ 132 V<br>Bus B $\leq$ 132 V<br><br>b. Undervoltage<br><br>Bus A $\geq$ 115 V<br>Bus B $\geq$ 115 V<br><br>c. Underfrequency (with time delay set to $\leq$ 4.0 seconds.)<br><br>Bus A $\geq$ 57 Hz<br>Bus B $\geq$ 57 Hz | 24 months |
| SR 3.3.8.2.3 | Perform a system functional test. | 24 months |

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 Flow Control Valves (FCVs)

LCO 3.4.2 A recirculation loop FCV shall be OPERABLE in each operating recirculation loop.

APPLICABILITY: MODES 1 and 2.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each FCV.
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| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or two required FCVs inoperable. | A.1 Lock up the FCV. | 4 hours |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.2.1 | Verify each FCV fails "as is" on loss of hydraulic pressure at the hydraulic unit. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.2.2 | Verify average rate of each FCV movement is:<br>a. ≤ 11% of stroke per second for opening; and<br>b. ≤ 11% of stroke per second for closing. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.4.4.2 | ----------NOTE----------<br>Valve actuation may be excluded.<br>----------<br><br>Verify each required relief function S/RV actuates on an actual or simulated automatic initiation signal. | 24 months |
| SR 3.4.4.3 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br><br>Verify each required S/RV relief mode actuator strokes when manually actuated. | In accordance with the Inservice Testing Program on a STAGGERED TEST BASIS for each valve solenoid |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.7.1 | Perform CHANNEL CHECK of required drywell atmospheric monitoring system. | 12 hours |
| SR 3.4.7.2 | Perform CHANNEL FUNCTIONAL TEST of required leakage detection instrumentation. | 31 days |
| SR 3.4.7.3 | Perform CHANNEL CALIBRATION of required leakage detection instrumentation. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.1.5 | ----------NOTE----------<br>Vessel injection/spray may be excluded.<br>----------<br>Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal. | 24 months |
| SR 3.5.1.6 | ----------NOTE----------<br>Valve actuation may be excluded.<br>----------<br>Verify the ADS actuates on an actual or simulated automatic initiation signal. | 24 months |
| SR 3.5.1.7 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br>Verify each ADS valve relief mode actuator strokes when manually actuated. | In accordance with the Inservice Testing Program on a STAGGERED TEST BASIS for each valve solenoid |
| SR 3.5.1.8 | ----------NOTE----------<br>ECCS actuation instrumentation is excluded.<br>----------<br>Verify the ECCS RESPONSE TIME for each ECCS injection/spray subsystem is within limits. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | | | FREQUENCY |
|---|---|---|---|---|
| SR 3.5.2.5 | Verify each required ECCS pump develops the specified flow rate with the specified pump differential pressure. | | | In accordance with the Inservice Testing Program |
| | SYSTEM | FLOW RATE | PUMP DIFFERENTIAL PRESSURE | |
| | LPCS | ≥ 5010 gpm | ≥ 282 psid | |
| | LPCI | ≥ 5050 gpm | ≥ 102 psid | |
| | HPCS | ≥ 5010 gpm | ≥ 415 psid | |
| SR 3.5.2.6 | ----------NOTE---------- Vessel injection/spray may be excluded. ---------- | | | |
| | Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal. | | | 24 months |

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.5.3.1 | Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve. | 31 days |
| SR 3.5.3.2 | Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position. | 31 days |
| SR 3.5.3.3 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br>Verify, with RCIC steam supply pressure ≤ 1075 psig and ≥ 920 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure. | 92 days |
| SR 3.5.3.4 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br>Verify, with RCIC steam supply pressure ≤ 165 psig and ≥ 150 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.3.5 | ----------NOTE----------<br>Vessel injection may be excluded.<br>----------<br>Verify the RCIC System actuates on an actual or simulated automatic initiation signal. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.2.4 | Verify, from an initial pressure of 90 psig, the primary containment air lock seal pneumatic system pressure does not decay at a rate equivalent to > 1.50 psig for a period of 24 hours. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.4 | Verify the isolation time of each power operated and each automatic PCIV, except MSIVs, is within limits. | In accordance with the Inservice Testing Program |
| SR 3.6.1.3.5 | ----------NOTE----------<br>Only required to be met in MODES 1, 2, and 3.<br>----------<br>Perform leakage rate testing for each primary containment purge valve with resilient seals. | In accordance with the Primary Containment Leakage Rate Testing Program |
| SR 3.6.1.3.6 | Verify the isolation time of each MSIV is $\geq$ 3 seconds and $\leq$ 5 seconds. | In accordance with the Inservice Testing Program |
| SR 3.6.1.3.7 | Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.8 | Verify in-leakage rate of ≤ 340 scfh for each of the following valve groups when tested at 11.5 psid for MS-PLCS valves.<br><br>a. Division I MS-PLCS valves<br><br>b. Division II MS-PLCS valves | 24 months |
| SR 3.6.1.3.9 | ----------NOTE----------<br>Only required to be met in MODES 1, 2, and 3.<br>----------<br><br>Verify the combined leakage rate for all secondary containment bypass leakage paths is ≤ 580,000 cc/hr when pressurized to ≥ $P_a$. | In accordance with the Primary Containment Leakage Rate Testing Program |

(continued)

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.6.1.6.1 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>---<br>Verify each LLS valve relief mode actuator strokes when manually actuated. | In accordance with the Inservice Testing Program on a STAGGERED TEST BASIS for each valve solenoid |
| SR 3.6.1.6.2 | ----------NOTE----------<br>Valve actuation may be excluded.<br>---<br>Verify the LLS System actuates on an actual or simulated automatic initiation signal. | 24 months |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.7.1 | Verify each required primary containment unit cooler pressure relief and backdraft damper in the flow path that is not locked, sealed, or otherwise secured in position, is in the correct position. | 31 days |
| SR 3.6.1.7.2 | Verify each required primary containment unit cooler develops a flow rate of ≥ 50,000 cfm on recirculation flow through the unit cooler. | 92 days |
| SR 3.6.1.7.3 | Verify each required primary containment unit cooler actuates throughout its emergency operating sequence on an actual or simulated automatic initiation signal. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.9.2 | Operate each PVLCS compressor ≥ 15 minutes. | 31 days |
| SR 3.6.1.9.3 | Perform a system functional test of each MS-PLCS subsystem. | 24 months |

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. Required Action and associated Completion Time not met. | C.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.3.2.1 | Energize each primary containment and drywell hydrogen igniter division and perform current versus voltage measurements to verify required igniters in service. | 184 days |
| SR 3.6.3.2.2 | ----------NOTE----------<br>Not required to be performed until 92 days after discovery of four or more igniters in the division inoperable.<br>---------- | |
| | Energize each primary containment and drywell hydrogen igniter division and perform current versus voltage measurements to verify required igniters in service. | 92 days |
| SR 3.6.3.2.3 | Verify each required igniter in inaccessible areas develops sufficient current draw for a $\geq$ 1700°F surface temperature. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.3.2.4 | Verify each required igniter in accessible areas develops a surface temperature of ≥ 1700°F. | 24 months |

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. Required Action and associated Completion Time not met. | C.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.3.3.1 | Operate each primary containment/drywell hydrogen mixing subsystem for ≥ 15 minutes. | Every COLD SHUTDOWN, if not performed within the previous 92 days. |
| SR 3.6.3.3.2 | Verify each primary containment/drywell hydrogen mixing subsystem flow rate is ≥ 600 cfm. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.1.2 | Verify all secondary containment equipment hatches are closed and sealed and loop seals filled. | 31 days |
| SR 3.6.4.1.3 | Verify each secondary containment access door is closed, except when the access opening is being used for entry and exit. | 31 days |
| SR 3.6.4.1.4 | Verify each standby gas treatment (SGT) subsystem will draw down the shield building annulus and auxiliary building to $\geq 0.5$ and $\geq 0.25$ inch of vacuum water gauge in $\leq 18.5$ and $\leq 34.5$ seconds, respectively. | 24 months on a STAGGERED TEST BASIS |
| SR 3.6.4.1.5 | Deleted | Not Applicable |
| SR 3.6.4.1.6 | Verify each SGT subsystem can maintain $\geq 0.5$ and $\geq 0.25$ inch of vacuum water gauge in the shield building annulus and auxiliary building, respectively, for 1 hour. | 24 months on a STAGGERED TEST BASIS |
| SR 3.6.4.1.7 | Deleted | Not Applicable |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.2.1 | Verify the isolation time of each required power operated automatic SCID and FBID is within limits. | 92 days |
| SR 3.6.4.2.2 | Verify each required automatic SCID and FBID actuates to the isolation position on an actual or simulated automatic isolation signal. | 24 months |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.3.1 | Operate each SGT subsystem for ≥ 10 continuous hours with heaters operating. | 31 days |
| SR 3.6.4.3.2 | Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP). | In accordance with the VFTP |
| SR 3.6.4.3.3 | Verify each SGT subsystem actuates on an actual or simulated initiation signal. | 24 months |
| SR 3.6.4.3.4 | Verify each SGT filter cooling bypass damper can be opened and the fan started. | 24 months |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.7.1 | Verify one fuel building ventilation charcoal filtration subsystem in operation. | 12 hours |
| SR 3.6.4.7.2 | Operate each fuel building ventilation charcoal filtration subsystem for ≥ 10 continuous hours with heaters operating. | 31 days |
| SR 3.6.4.7.3 | Perform fuel building ventilation charcoal filtration filter testing in accordance with the Ventilation Filter Testing Program (VFTP). | In accordance with the VFTP |
| SR 3.6.4.7.4 | Verify each fuel building ventilation charcoal filtration subsystem actuates on an actual or simulated initiation signal. | 24 months |
| SR 3.6.4.7.5 | Verify each fuel building ventilation charcoal filtration filter cooling bypass damper can be opened and the fan started. | 24 months |

3.6 CONTAINMENT SYSTEMS

3.6.5.1 Drywell

LCO 3.6.5.1 The drywell shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Drywell inoperable. | A.1 | Restore drywell to OPERABLE status. | 1 hour |
| B. Required Action and associated Completion Time not met. | B.1 | Be in MODE 3. | 12 hours |
| | AND | | |
| | B.2 | Be in MODE 4. | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.1.1 | Verify personnel door inflatable seal air flask pressure ≥ 75 psig. | 7 days |
| SR 3.6.5.1.2 | Verify from an initial pressure of 75 psig, the personnel door inflatable seal pneumatic system pressure does not decay at a rate equivalent to ≥ 20.0 psig for a period of 24 hours. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.6.5.2.1 | Deleted | |
| SR 3.6.5.2.2 | Verify drywell air lock seal air flask pressure is ≥ 75 psig. | 7 days |
| SR 3.6.5.2.3 | ----------NOTE----------<br>Only required to be performed upon entry into drywell.<br>----------<br>Verify only one door in the drywell air lock can be opened at a time. | 24 months |
| SR 3.6.5.2.4 | Deleted | |
| SR 3.6.5.2.5 | Verify, from an initial pressure of 75 psig, the drywell air lock seal pneumatic system pressure does not decay at a rate equivalent to > 20.0 psig for a period of 24 hours. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.3.4 | Verify the isolation time of each power operated and each automatic drywell isolation valve is within limits. | In accordance with the Inservice Testing Program |
| SR 3.6.5.3.5 | Verify each automatic drywell isolation valve actuates to the isolation position on an actual or simulated isolation signal. | 24 months |
| SR 3.6.5.3.6 | Verify the cumulative time that the primary containment/drywell hydrogen mixing inlet or outlet penetrations are open to be $\leq$ 5 hours per 365 days in Modes 1 and 2, and $\leq$ 90 hours per 365 days in Mode 3. | 31 days |

SURVEILLANCE REQUIREMENTS (continued)

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.7.1.4 | Verify each required SSW subsystem manual, power operated, and automatic valve in the flow path servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position. | 31 days |
| SR 3.7.1.5 | Verify each SSW subsystem actuates on an actual or simulated initiation signal. | 24 months |

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| F. Two CRFA subsystems inoperable during movement of recently irradiated fuel assemblies in the primary containment or fuel building, or during OPDRVs. | F.1 Suspend movement of recently irradiated fuel assemblies in the primary containment and fuel building.<br><br>AND | Immediately |
| OR<br><br>One or more CRFA subsystems inoperable due to inoperable CRE boundary during movement of recently irradiated fuel assemblies in the primary containment or fuel building, or during OPDRVs. | F.2 Initiate action to suspend OPDRVs. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.2.1 | Operate each CRFA subsystem for ≥ 10 continuous hours with the heaters operating. | 31 days |
| SR 3.7.2.2 | Perform required CRFA filter testing in accordance with the Ventilation Filter Testing Program (VFTP). | In accordance with the VFTP |
| SR 3.7.2.3 | Verify each CRFA subsystem actuates on an actual or simulated initiation signal. | 24 months |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. Required Action and associated Completion Time of Condition B not met during movement of recently irradiated fuel assemblies in the primary containment or fuel building, or during OPDRVs. | E.1 Suspend movement of recently irradiated fuel assemblies in the primary containment and fuel building.<br><br>AND<br><br>E.2 Initiate action to suspend OPDRVs. | Immediately<br><br>Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.3.1 | Verify each control room AC subsystem has the capability to remove the assumed heat load. | 24 months |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.5.1 | Verify one complete cycle of each main turbine bypass valve. | 31 days |
| SR 3.7.5.2 | Perform a system functional test. | 24 months |
| SR 3.7.5.3 | Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.7 | ----------NOTE----------<br>All DG starts may be preceded by an engine prelube period.<br>---<br><br>Verify each DG starts from standby conditions and achieves:<br><br>a. For DG 1A and DG 1B:<br><br>1. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and<br><br>2. Steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.<br><br>b. For DG 1C:<br><br>1. Maximum of 5400 V, and 66.75 Hz, and<br><br>2. In ≤ 13 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and<br><br>3. Steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz. | 184 days |
| SR 3.8.1.8 | ----------NOTE----------<br>This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR.<br>---<br><br>Verify manual transfer of unit power supply from the normal offsite circuit to required alternate offsite circuit. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.9 | ----------NOTE----------<br>1. Credit may be taken for unplanned events that satisfy this SR.<br>2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9<br>---<br>Verify each DG rejects a load greater than or equal to its associated single largest post accident load and following load rejection, the engine speed is maintained less than nominal plus 75% of the difference between nominal speed and the overspeed trip setpoint or 15% above nominal, whichever is lower. | 24 months |
| SR 3.8.1.10 | ----------NOTE----------<br>Credit may be taken for unplanned events that satisfy this SR.<br>---<br>Verify each DG operating at a power factor ≤ 0.9 does not trip and voltage is maintained ≤ 4784 V for DG 1A and DG 1B and ≤ 5400 V for DG 1C during and following a load rejection of a load ≥ 3030 kW and ≤ 3130 kW for DGs 1A and 1B and ≥ 2500 kW and ≤ 2600 kW for DG 1C. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.11 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period.<br><br>2. This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify on an actual or simulated loss of offsite power signal:<br><br>a. De-energization of emergency buses;<br><br>b. Load shedding from emergency buses for Divisions I and II; and<br><br>c. DG auto-starts from standby condition and:<br><br>1. energizes permanently connected loads in ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C,<br><br>2. energizes auto-connected shutdown loads,<br><br>3. maintains steady state voltage ≥ 3740 V and ≤ 4580 V,<br><br>4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and<br><br>5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.12 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period.<br>2. This Surveillance shall not be performed in MODE 1 or 2. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR.<br>----------<br>Verify on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal each DG auto-starts from standby condition and:<br>a. For DG 1C during the auto-start maintains voltage ≤ 5400 V and frequency ≤ 66.75 Hz;<br>b. In ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C after auto-start and during tests, achieves voltage ≥ 3740 V and frequency ≥ 58.8 Hz.<br>c. Achieves steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz; and<br>d. Operates for ≥ 5 minutes. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.13 | ----------NOTE----------<br>This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR.<br>---------- | |
| | Verify each DG's automatic trips are bypassed on an actual or simulated ECCS initiation signal except:<br><br>a. Engine overspeed; and<br><br>b. Generator differential current. | 24 months |
| SR 3.8.1.14 | ----------NOTES----------<br>1. Momentary transients outside the load and power factor ranges do not invalidate this test.<br><br>2. Credit may be taken for unplanned events that satisfy this SR.<br>---------- | |
| | Verify each DG operating at a power factor ≤ 0.9, operates for ≥ 24 hours:<br><br>a. For DG 1A and DG 1B loaded ≥ 3030 kW and ≤ 3130 kW; and<br><br>b. For DG 1C:<br><br>1. For ≥ 2 hours loaded ≥ 2750 kW and ≤ 2850 kW, and<br><br>2. For the remaining hours of the test loaded ≥ 2500 kW and ≤ 2600 kW. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.15 | ----------NOTES----------<br>1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 1 hour loaded ≥ 3000 kW and ≤ 3100 kW for DG 1A and DG 1B, and ≥ 2500 kW and ≤ 2600 for DG 1C, or operating temperatures have stabilized, which ever is longer.<br><br>Momentary transients outside of the load range do not invalidate this test.<br><br>2. All DG starts may be preceded by an engine prelube period.<br>---<br><br>Verify each DG starts and achieves:<br><br>1. In ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C voltage ≥ 3740 V and frequency ≥ 58.8 Hz, and<br><br>2. Steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz. | 24 months |
| SR 3.8.1.16 | ----------NOTE----------<br>This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR.<br>---<br><br>Verify each DG:<br><br>a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power;<br><br>b. Transfers loads to offsite power source; and<br><br>c. Returns to ready-to-load operation. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.17 | ----------NOTE----------<br>This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ECCS initiation signal overrides the test mode by:<br><br>a. Returning DG to ready-to-load operation; and<br><br>b. Automatically energizing the emergency loads from offsite power. | 24 months |
| SR 3.8.1.18 | ----------NOTE----------<br>This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify sequence time is within ± 10% of design for each load sequencer timer. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.19 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period.<br>2. This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR.<br>----------<br>Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal:<br>a. De-energization of emergency buses;<br>b. Load shedding from emergency buses for Divisions I and II; and<br>c. DG auto-starts from standby condition and:<br>1. energizes permanently connected loads in ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C,<br>2. energizes auto-connected emergency loads,<br>3. achieves steady state voltage ≥ 3740 V and ≤ 4580 V,<br>4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and<br>5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.8.4.1 | Verify battery terminal voltage is ≥ 130.2 V on float charge. | 7 days |
| SR 3.8.4.2 | Verify no visible corrosion at battery terminals and connectors.<br><br>OR<br><br>Verify battery connection resistance is<br>≤ 1.5 E-4 ohm for inter-cell connections,<br>≤ 1.5 E-4 ohm for inter-rack connections,<br>≤ 1.5 E-4 ohm for inter-tier connections, and<br>≤ 1.5 E-4 ohm for terminal connections. | 92 days |
| SR 3.8.4.3 | Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration. | 24 months |
| SR 3.8.4.4 | Remove visible corrosion, and verify battery cell to cell and terminal connections are coated with anti-corrosion material. | 24 months |
| SR 3.8.4.5 | Verify battery connection resistance is<br>≤ 1.5 E-4 ohm for inter-cell connections,<br>≤ 1.5 E-4 ohm for inter-rack connections,<br>≤ 1.5 E-4 ohm for inter-tier connections, and<br>≤ 1.5 E-4 ohm for terminal connections. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.4.6 | Verify each battery charger supplies ≥ 300 amps for chargers 1A and 1B and ≥ 50 amps for charger 1C at ≥ 130.2 V for ≥ 8 hours. | 24 months |
| SR 3.8.4.7 | ----------NOTES----------<br>1. SR 3.8.4.8 may be performed in lieu of SR 3.8.4.7 once per 60 months.<br>2. This Surveillance shall not be performed in MODE 1, 2, or 3 (not applicable to Division III). However, credit may be taken for unplanned events that satisfy this SR.<br>---------- | |
| | Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test. | 24 months |

(continued)

| ASME OM Code and applicable Addenda terminology for inservice testing activities | Required frequencies for performing inservice testing activities |
|---|---|
| Weekly | At least once per 7 days |
| Monthly | At least once per 31 days |
| Quarterly or every 3 months | At least once per 92 days |
| Semiannually or every 6 months | At least once per 184 days |
| Every 9 months | At least once per 276 days |
| Yearly or annually | At least once per 366 days |
| Biennially or every 2 years | At least once per 731 days |

b. The provisions of SR 3.0.2 are applicable to the above required frequencies and to other normal and accelerated frequencies specified as 2 years or less in the Inservice Testing Program for performing inservice testing activities;

c. The provisions of SR 3.0.3 are applicable to inservice testing activities; and

d. Nothing in the ASME OM Code shall be construed to supersede the requirements of any TS.

5.5.7 Ventilation Filter Testing Program (VFTP)

A program shall be established to implement the following required testing of Engineered Safety Feature (ESF) filter ventilation systems at the frequencies specified in Regulatory Guide 1.52, Revision 2, except that testing specified at a frequency of 18 months is required at a frequency of 24 months.

a. Demonstrate for each of the ESF systems that an inplace test of the high efficiency particulate air (HEPA) filters shows a penetration and system bypass < 0.05% when tested in accordance with Regulatory Guide 1.52, Revision 2, and ASME N510-1989 at the system flowrate specified below ± 10%:

| ESF Ventilation System | Flowrate |
|---|---|
| SGTS | 12,500 cfm |
| FBVS | 10,000 cfm |
| CRFAS | 4,000 cfm |

(continued)

5.5.14 Control Room Envelope Habitability Program (continued)

OPERABLE Control Room Fresh Air (CRFA) System, CRE occupants can control the reactor safely under normal conditions and maintain it in a safe condition following a radiological event, hazardous chemical release, or a smoke challenge. The program shall ensure that adequate radiation protection is provided to permit access and occupancy of the CRE under design basis accident (DBA) conditions without personnel receiving radiation exposures in excess of 5 rem total effective dose equivalent (TEDE) for the duration of the accident. The program shall include the following elements:

a. The definition of the CRE and the CRE boundary.

b. Requirements for maintaining the CRE boundary in its design condition including configuration control and preventive maintenance.

c. Requirements for (i) determining the unfiltered air inleakage past the CRE boundary into the CRE in accordance with the testing methods and at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, and, (ii) assessing CRE habitability at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0, except that testing specified at a frequency of 18 months is required at a frequency of 24 months.

d. Measurement, at designated locations, of the CRE pressure relative to all external areas adjacent to the CRE boundary during the pressurization mode of operation by one subsystem of the CRFA System, operating at the flow rate required by the VFTP, at a Frequency of 24 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the 24 month assessment of the CRE boundary.

e. The quantitative limits on unfiltered air inleakage into the CRE. These limits shall be stated in a manner to allow direct comparison to the unfiltered air inleakage measured by the testing described in paragraph c. The unfiltered air inleakage limit for radiological challenges is the inleakage flow rate assumed in the licensing basis analyses of DBA consequences. Unfiltered air inleakage limits for hazardous chemicals must ensure that exposure of CRE occupants to these hazards will be within the assumptions in the licensing basis.

f. The provisions of SR 3.0.2 are applicable to the Frequencies for assessing CRE habitability, determining CRE unfiltered inleakage, and measuring CRE pressure and assessing the CRE boundary as required by paragraphs c and d, respectively.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 168 TO

FACILITY OPERATING LICENSE NO. NPF-47

ENTERGY OPERATIONS, INC.

RIVER BEND STATION, UNIT 1

DOCKET NO. 50-458

## 1.0 INTRODUCTION

By application dated August 10, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML092470152), as supplemented by letters dated December 8, 2009, April 22, June 16, and August 17, 2010 (ADAMS Accession Nos. ML093490995, ML101170109, ML101800337, and ML102350155, respectively), and e-mails dated June 29, July 12, and July 28, 2010 (ADAMS Accession Nos. ML101830455, ML101930093, ML101930100, and ML102090554, respectively) Entergy Operations, Inc. (Entergy, the licensee), requested changes to the Technical Specifications (TSs) for the River Bend Station, Unit 1 (RBS). The supplements dated December 8, 2009, April 22, June 16, and August 17, 2010, and emails dated June 29, July 12, and July 28, 2010, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on October 20, 2009 (74 FR 53776).

The amendment will revise the TSs for the RBS to support operation with 24-month fuel cycles. Specifically, the change would revise the frequency of certain TS Surveillance Requirements (SRs) from "18 months" to "24 months," in accordance with the guidance of Generic Letter (GL) 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle." Consistent with the GL, changes were proposed to the Administrative Controls Section 5.5.7, "Ventilation Filter Testing Program (VFTP)," to address changes to 18-month frequencies that are specified in Regulatory Guide (RG) 1.52, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," and Section 5.5.14, "Control Room Envelope Habitability Program," to address changes to 18-month frequencies that are specified in RG 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors." Also, changes were proposed to the TS allowable values for loss of

power instrumentation (TS 3.3.8), as well as the standby liquid control available Boron-10 weight (TS 3.1.7). By letter dated June 16, 2010, Entergy withdrew its proposed changes to TS 3.3.8 regarding the change to the degraded voltage instrumentation allowable values as indicated on Table 3.3.8.1-1 and to extend the SR 3.3.8.1.3 and 3.3.8.1.4 from 18 to 24 months. By letter dated August 17, 2010, Entergy withdrew the request for not revising SR 3.3.8.1.4 and requested that this SR be extended as originally requested. These proposed changes reduce the scope of the application as originally noticed and therefore, did not change the NRC staff's original proposed no significant hazards consideration determination.

## 2.0 REGULATORY EVALUATION

Regulatory requirement 10 CFR 50.36, "Technical specifications," provides the content required in a licensee's TS. Specifically, 10 CFR 50.36(c)(3) requires that the TS include surveillance requirements to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation are met.

NRC GL 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," provides generic guidance for evaluating a 24-month surveillance test interval for TS SRs. GL 91-04 indicates that SRs with an 18-month frequency requirement that are not instrument calibration related should be evaluated for the effect on safety associated with an extension to a 24-month required interval. This evaluation by a licensee should:

- analyze the effect on plant safety from the change in surveillance intervals to accommodate a 24-month fuel cycle. This evaluation should support a conclusion that the effect on safety is small.

- confirm that historical maintenance and surveillance data do not invalidate this conclusion that the effect on safety is small.

- confirm that the performance of surveillance at the bounding surveillance interval limit would not invalidate any assumption in the plant licensing basis.

For those surveillances where the evaluation accomplishes these goals, the licensees need not quantify the effect of the change in surveillance intervals on the availability of individual systems or components. No change in the existence, testability or availability of plant systems and components is being requested, only the extension in the frequency of tests or inspections.

The staff considered the regulatory guidance provided in GL 91-04, "Changes in Technical Specification Surveillance Intervals To Accommodate a 24-Month Fuel Cycle," dated April 2, 1991. The licensee divided the proposed TS changes related to GL 91-04 test interval extension into two categories—category A for noncalibration-related changes and category B for calibration-related changes.

GL 91-04 also stipulates that the licensee should evaluate the following for calibration-related frequency changes:

- Confirm that instrument drift as determined by as-found and as-left calibration data from surveillance and maintenance records has not, except on rare occasions, exceeded acceptable limits for a calibration interval.

- Confirm that the values of drift for each instrument type (make, model, and range) and application have been determined with a high probability and a high degree of confidence. Summarize the methodology and assumptions used to determine the rate of instrument drift with time based upon historical plant calibration data.

- Confirm that the magnitude of instrument drift has been determined with a high probability and a high degree of confidence for a bounding calibration interval of 30 months for each instrument type (make, model number, and range) and application that performs a safety function. Provide a list of the channels by TS section that identifies these instrument applications.

- Confirm that a comparison of the projected instrument drift errors has been made with the values of drift used in the setpoint analysis. If this results in revised setpoints to accommodate larger drift errors, provide proposed TS changes to update trip setpoints. If the drift errors result in a revised safety analysis to support existing setpoints, summarize the updated analysis conclusions to confirm that safety limits and safety analysis assumptions are not exceeded.

- Confirm that the projected instrument errors caused by drift are acceptable for the control of plant parameters to affect a safe shutdown with the associated instrumentation.

- Confirm that all conditions and assumptions of the setpoint and safety analyses have been checked and are appropriately reflected in the acceptance criteria of plant surveillance procedures for channel checks, channel functional tests, and channel calibrations.

- Provide a summary description of the program for monitoring and assessing the effects of increased calibration surveillance intervals on instrument drift and on safety.

RG 1.105, "Setpoints for Safety-Related Instrumentation," Revision 3, issued December 1999 (ADAMS Accession No. ML993560062), describes a method that the NRC staff considers acceptable for complying with the agency's regulations for ensuring that setpoints for safety-related instrumentation are initially within and remain within the TS limits. RG 1.105 endorses Part I of Instrument Society of America (ISA) Standard 67.04-1994, "Setpoints for Nuclear Safety-Related Instrumentation," subject to NRC staff clarifications. The staff used this guide to establish the adequacy of the licensee's setpoint calculation methodologies and the related plant surveillance procedures.

Similar license amendments have been approved for Browns Ferry Nuclear Plant Unit 1 (September 28, 2006, ML0621700020), Clinton Power Station Unit 1 (October 21, 2005, ML0529404800), and Monticello Nuclear Generating Plant (September 30, 2005, ML0527002520).

## 3.0 TECHNICAL EVALUATION

Improved reactor fuels allow licensees to consider an increase in the duration of the fuel cycle for their facilities. The staff has reviewed requests for individual plants to modify TS surveillance intervals to be compatible with a 24-month fuel cycle. The staff issued GL 91-04 to provide generic guidance to licensees for preparing such license amendment requests.

For each of the proposed surveillance extensions, the licensee collected the most recent surveillance test results and associated maintenance records for at least five of the most recent cycles of operation before and including the refueling outage in spring 2008, which is equivalent to three 30-month surveillance periods. The licensee collected at least 30 samples, where possible, for each proposed TS change to ensure a 95/95 confidence level. Drift calculations produced values with a 95% probability, with a 95% confidence. Where adequate data did not exist for a rigorous drift calculation, separate assessments were prepared to produce a high probability with a high degree of confidence. In addition to evaluating the historical drift data with 18-month calibrations, the licensee also evaluated the failure history of the related instrumentations.

### 3.1 Noncalibration-Related Changes

#### 3.1.1 TS 3.1.7 Standby Liquid Control (SLC) System - SR 3.1.7.8

The surveillance test interval of this SR is being increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the 25-percent grace period. The flow path through one SLC subsystem is verified per SR 3.1.7.8 during every refueling outage on a staggered test basis. Since, this test could inadvertently cause a reactor transient if performed with the unit operating, it is performed during outage conditions in order to decrease the potential impact of the test.

The licensee stated that the SLC pumps are tested in accordance with the Inservice Testing (IST) Program per SR 3.1.7.7 to verify operability. Similarly, the temperature of the sodium pentaborate solution in the storage tank and the temperature of the pump suction piping are verified to be $\geq$ 45 °F every 24 hours in accordance with SR 3.1.7.2 to preclude precipitation of the boron solution. The equipment and tank containing the solution are installed in a room in which the air temperature is maintained within the range of 70 °F to 100 °F. In addition, an installed backup heater (automatically controlled) is used to maintain solution temperature above the saturation point (39 °F to 32 °F). Moreover, SR 3.1.7.4 verifies the continuity of the charge in the explosive valves. These more frequent tests ensure that the SLC system remains operable during the operating cycle. A review of the surveillance history verified that this subsystem had no previous failures of the TS functions that would have been detected solely by the periodic performance of these SRs.

The NRC staff reviewed the proposed change and the licensee's justification for the change. The staff determined that because of the subsystem testing required by the TS surveillances and the history of the subsystem performance, the impact of this change on safety is small. The staff approves the revised SR in TS 3.1.7 based on, 1) consistency with the guidance provided in the GL 91-04, 2) historical plant maintenance and surveillance data supporting the

conclusion, and 3) that the assumptions in the plant licensing-basis would not be invalidated as a result of this revision.

In addition, the licensee stated that the current required reactor vessel boron weight for cold shutdown may not be adequate for the future cycles (cycles 18 and 19). For Cycles 18 and 19, the margin to the Updated Safety Analysis Report (USAR) requirement for maintaining cold shutdown is small, and may impact core design negatively and increase fuel costs. As a result, the licensee has conservatively opted to increase the required quantity of Boron-10 injected into the vessel to ensure that future core designs are not negatively impacted. The TS 3.1.7.5 required weight of the Boron-10 contained in the RBS SLC tank minimum required available solution volume will be increased from 143 lbm to 170 lbm to ensure adequate margin for future core designs. The proposed TS change is conservative in nature and therefore is acceptable.

3.1.2 TS 3.1.8 Scram Discharge Volume (SDV) Vent and Drain Valves - SR 3.1.8.3

The surveillance test interval of this SR is being increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the 25-percent grace period. This SR confirms that the SDV vent and drain valves close in less than 30 seconds after the scram initiation, and open when the scram signal is reset.

The licensee stated that SR 3.1.8.2 requires that the SDV vent and drain valves be cycled fully closed and fully open every 92 days during the operating cycle, which ensures that the mechanical components and a portion of the valve logic remain operable. Additionally, as discussed in Section 3.14 the failure rate of components is dominated by the mechanical components, not by the logic systems. A review of the applicable plant surveillance history demonstrated that the logic subsystem for the scram discharge volume vent and drain valves had no previous failures of the TS function that would have been detected solely by the periodic performance of this SR.

The NRC staff reviewed the proposed change and the licensee's justification for the change. The staff determined that because of the manual cycling of the valves to ensure that the valves are operable, as required by SR 3.1.8.2, and the history of the logic subsystem performance, the impact of this change on safety is small. The staff approves the revised SR in TS 3.1.8 based on, 1) consistency with the guidance provided in the GL 91-04, 2) historical plant maintenance and surveillance data supporting the conclusion, and 3) that the assumptions in the plant licensing-basis would not be invalidated as a result of this revision.

3.1.3 TS 3.3.1.1 Reactor Protection System (RPS) Instrumentation:

SR 3.3.1.1.14 Verify the APRM Flow Biased Simulated Thermal Power—High time constant is within the limits specified in the COLR.

The licensee is increasing the surveillance test interval in this surveillance requirement (SR) from once every 18 months to once every 24 months, for a maximum interval of 30 months, including the 25-percent grace period. The licensee stated that this testing will detect significant failures of this circuitry and ensure that a significant portion of it is operating properly. Operation

of the circuits associated with this trip function are verified more frequently by channel check (i.e., SR 3.3.1.1.1), verification of the absolute difference between average power range monitor (APRM) channels (i.e., SR 3.3.1.1.2), verification of the flow signal (i.e., SR 3.3.1.1.3), channel functional test (i.e., SR 3.3.1.1.9), and channel calibration (i.e., SR 3.3.1.1.11).

The licensee's review of the surveillance history demonstrated that this circuit had no previous failures of the TS function that would have been detected solely by the periodic performance of this SR.

Based on the checks required by the other TS surveillances and the history of the circuit failures, the staff agrees that the impact of this change on safety, if any, is small and the proposed TS change complies with GL 91-04.

3.1.4 Logic System Functional Tests (LSFTs) and Selected Channel Functional Tests:

TS 3.3.1.1 Reactor Protection System (RPS) Instrumentation:

SR 3.3.1.1.12 Perform CHANNEL FUNCTIONAL TEST.

SR 3.3.1.1.15 Perform LOGIC SYSTEM FUNCTIONAL TEST.

TS 3.3.2.1 Control Rod Block Instrumentation:

SR 3.3.2.1.8 Perform CHANNEL FUNCTIONAL TEST.

TS 3.3.3.2 Remote Shutdown System:

SR 3.3.3.2.2 Verify each required control circuit and transfer switch is capable of performing the intended functions.

TS 3.3.4.1 End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation:

SR 3.3.4.1.4 Perform LOGIC SYSTEM FUNCTIONAL TEST, including breaker actuation.

TS 3.3.4.2 Anticipated Transient Without Scram Recirculation Pump Trip (ATWS- RPT) Instrumentation:

SR 3.3.4.2.5 Perform LOGIC SYSTEM FUNCTIONAL TEST, including breaker actuation.

TS 3.3.5.1 Emergency Core Cooling System (ECCS) Instrumentation:

SR 3.3.5.1.6 Perform LOGIC SYSTEM FUNCTIONAL TEST.

TS 3.3.5.2 Reactor Core Isolation Cooling (RCIC) System Instrumentation:

SR 3.3.5.2.5 Perform LOGIC SYSTEM FUNCTIONAL TEST.

TS 3.3.6.1 Primary Containment and Drywell Isolation Instrumentation:

SR 3.3.6.1.6 Perform LOGIC SYSTEM FUNCTIONAL TEST.

TS 3.3.6.2 Secondary Containment and Fuel Building Isolation Instrumentation:

SR 3.3.6.2.5 Perform LOGIC SYSTEM FUNCTIONAL TEST.

TS 3.3.6.3 Containment Unit Cooler System Instrumentation:

SR 3.3.6.3.5 Perform LOGIC SYSTEM FUNCTIONAL TEST.

TS 3.3.6.4 Relief and Low-Low Set (LLS) Instrumentation:

SR 3.3.6.4.4 Perform LOGIC SYSTEM FUNCTIONAL TEST.

TS 3.3.7.1 Control Room Fresh Air (CRFA) System Instrumentation:

SR 3.3.7.1.5 Perform LOGIC SYSTEM FUNCTIONAL TEST.

The licensee stated that extending the surveillance test interval for the LSFTs and selected functional tests is acceptable because the functions are verified to be operating properly by the performance of more frequent channel checks, channel functional tests, analog trip module calibration, and visual confirmation of satisfactory operation (as applicable). This more frequent testing will detect significant failures within the instrument loop and ensure that a major portion of the circuitry is operating properly. Additionally, all of the above actuation instrumentation and logic, controls, monitoring capabilities, and protection systems are designed to meet applicable reliability, redundancy, single-failure, and qualification standards and regulations, as described in the RBS USAR. As such, these functions are designed to be highly reliable. Furthermore, the August 2, 1993, NRC safety evaluation relating to the extension of the surveillance intervals for Peach Bottom Atomic Power Station, Units 2 and 3, from 18 to 24 months stated the following:

> Industry reliability studies for boiling water reactors (BWRs), prepared by the BWR Owners Group (NEDC-30936P) show that the overall safety systems' reliabilities are not dominated by the reliabilities of the logic systems, but by that of the mechanical components, (e.g., pumps and valves), which are consequently tested on a more frequent basis. Since the probability of a relay or contact failure is small relative to the probability of mechanical component failure, increasing the Logic System Functional Test interval represents no significant change in the overall safety system unavailability.

The licensee reviewed the applicable River Bend surveillance records for the above SRs and identified the following five failures:

(1) On February 14, 2006, relay B21C-K30A (SR 3.3.6.4.4-a) failed and was replaced with a new Agastat EGPDO04 relay. The licensee's troubleshooting indicated that the relay had an open coil and that the identified failure is unique, does not occur on a repetitive basis, and is not associated with a time-based failure mechanism.

(2) On January 2, 2007, the main steam isolation valves did not isolate as expected. The licensee's troubleshooting determined that relays B21H-K7F and B21H-K14B (SR 3.3.6.1.6-1.d) failed. Work orders called for replacing the relays with Potter & Brumfield MDR-4172 and Agastat EGPI004 relays, respectively, and a retest was performed satisfactorily. The licensee identified the failure as unique and one that does not occur on a repetitive basis and is not associated with a time-based failure mechanism.

(3) On November 28, 2002, relay E31A-K4A (SR 3.3.6.1.6, Functions 3.h and 5.a) failed to change state. The relay was replaced with a new Agastat EGPI004 relay and retested satisfactorily. The licensee identified the failure as unique and one that does not occur on a repetitive basis and is not associated with a time-based failure mechanism.

(4) On June 24, 1999, valve E51-MOVF076 failed to isolate on a DIV 2 simulated low-pressure isolation signal in a test procedure required by TS (SR 3.3.6.1.6 for Functions 3.a, 3.b, 3.c, 3.d, 3.e, 3.f, 3.g, and 3.i). Troubleshooting and repair by the licensee determined that a control power fuse was blown and that the reversing contactor coil was bad (low ohms). The licensee replaced the coil and fuse and satisfactorily stroke-timed the valve. Retesting was also performed satisfactorily. An investigation determined that this was a functional failure of the containment isolation valve. Furthermore, the licensee identified the failure as unique and one that does not occur on a repetitive basis and is not associated with a time-based failure mechanism.

(5) On March 13, 2000, the HVC-FN3C breaker tripped (SR 3.3.3.2.2). The licensee's troubleshooting determined that the problem was a defective breaker. The breaker had a "weak" phase, meaning that one phase of the breaker would trip at a lower current than the other two phases. The breaker was replaced with a new GE/TEC36007 molded-case circuit breaker and retested satisfactorily. During the retest, the breaker operated as designed. The licensee concluded that the identified failure is unique, does not occur on a repetitive basis, and is not associated with a time-based failure mechanism.

The licensee also performed a commonality review of the events of February 14, 2006; January 2, 2007; and November 28, 2002, on Agastat and Potter & Brumfield relay failures. It identified eight Agastat relay failures and two Potter & Brumfield relay failures over the review period. In all eight Agastat relay failures, the defective relays were replaced. For several of the historical failures, detailed evaluation indicated that the relays were not in the plant preventive maintenance programs because of an oversight in assigning identification numbers to skid-mounted equipment subcomponents. This oversight caused the licensee to leave some relays in service past their required service replacement dates, with resulting relay failures. The plant

subsequently evaluated all skid-mounted equipment to ensure that the subcomponents were identified and included in the preventive maintenance program. This activity resulted in the upgrading of a number of relays. The licensee identified that no time-based mechanisms were apparent in these failures, each of these failures was unique, and any subsequent failure would not result in a significant impact on system or component availability.

The licensee did not identify any failure similar to the events of June 24, 1999, and March 13, 2000, and concluded that the failures were not repetitive in nature. No time-based mechanisms were apparent. Therefore, the licensee concluded that these failures were unique, and any subsequent failures would not result in a significant impact on system or component availability.

The staff finds that the impact, if any, on system availability is small from the proposed change to a 24-month testing frequency. Based on more frequent testing of portions of the circuit, the history of logic system performance, and the corrective action for relay failures, the impact of this change on safety, if any, is small, and the proposed TS changes comply with GL 91-04.

3.1.5 Response Time Tests:

TS 3.3.1.1 Reactor Protection System (RPS) Instrumentation:

SR 3.3.1.1.18 Verify the RPS RESPONSE TIME is within limits.

TS 3.3.4.1 End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation:

SR 3.3.4.1.6 Verify the EOC-RPT SYSTEM RESPONSE TIME is within limits.

TS 3.3.6.1 Primary Containment and Drywell Isolation Instrumentation:

SR 3.3.6.1.7 Verify the ISOLATION SYSTEM RESPONSE TIME for the Main Steam Isolation Valves is within limits.

The licensee is increasing the surveillance test interval of these SRs of "on a staggered test basis" from once every 18 months to once every 24 months, for a maximum interval of 30 months including the 25-percent grace period. These functions are verified to be operating properly throughout the operating cycle by the performance of channel checks and channel functional tests (as applicable). This testing will detect significant failures of the circuitry and ensure that a significant portion of it is operating properly. The licensee stated that these functions, including the actuating logic, are designed to be single-failure proof and, therefore, are highly reliable.

Furthermore, the RBS TS bases, as well as NUREG-1434, "Standard Technical Specifications—General Electric Plants (BWR/6)," issued June 2004, state that the frequency of response time testing is based in part "upon plant operating experience, which shows that random failures of instrumentation components causing serious time degradation, but not channel failure, are infrequent."

The licensee reviewed the applicable RBS surveillance history and identified no previous failures in TS-required system response times that would have been detected solely by the periodic performance of these SRs. Based on other more frequent testing of portions of the circuits and the history of logic system performance, the licensee concluded that the impact of this change on safety, if any, is small. The NRC staff concurs with this conclusion.

The licensee also evaluated each of the affected SRs to establish the impact of the changes against the assumptions in the plant licensing basis. It observed no alteration that would require any change to the plant licensing basis and NRC review and approval. However, the licensee committed that, if required, it will submit all changes to the plant licensing basis in accordance with 10 CFR 50.59, "Changes, Tests and Experiments," and 10 CFR 50.71(e). The licensee also committed to trend the performance of the 24-month-fuel-cycle surveillance extensions as a part of the maintenance rule program and verify that degradation, if any, is not a result of the extension of the surveillance or maintenance activities.

Based on the evaluations the licensee has performed of surveillance history, impact on the plant licensing basis, commitments made on SR performance trends, tests performed by other plant programs, and the existing system redundancy and reliability, the NRC staff concludes that the proposed TS changes for noncalibration-related TS changes comply with GL 91-04 and are therefore acceptable.

3.1.6 Flow Control Valves (FCVs)

SR 3.4.2.1

The surveillance test interval of these SRs is being increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the 25 -percent grace period. This surveillance verifies that the FCV fails "as-is" on loss of hydraulic pressure.

SR 3.4.2.2 FCVs

The surveillance test interval of these SRs is being increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the 25 -percent grace period. This surveillance verifies the rate-limiting feature of the FCV that will limit the resulting rate of change of core flow and power to within safe limits in the event of an upscale or downscale failure of the valve position or velocity control system.

The hydraulic power unit pilot-operated lock out valves (i.e., pilot-operated check valves) are required to close on a loss of recirculation FCV hydraulic pressure. When closed, these valves inhibit FCV motion and preclude potentially excessive rate-of-change in reactor power from uncontrolled recirculation FCV movement. These valves are excluded from the IST program as they have no active safety-related function in the open or closed position. This SR requires fully stroking each reactor recirculation flow control valve for measurement of the test parameters. Due to the nature of the control components in this application these SRs cannot be performed during the operating cycle since there are no definable components or any time-based conditions that could appreciably change the rate of change for opening or closing the FCV. Fully stroking the FCVs at power would cause significant changes in reactor power since

reactor recirculation flow rate is a principle means of reactivity control. The NRC staff agrees that stroking these valves would cause unnecessary power transients during power operation. In addition, the licensee stated there are no definable drift components or any time-based conditions that could appreciably change during the operating cycle.

The licensee has stated that a review of the applicable RBS surveillance history has demonstrated that the hydraulic power unit pilot-operated lock out valves had no previous failures of the TS function that would have been detected solely by the periodic performance of this SR. The NRC staff agrees with the licensee's justification and concludes that the impact of this change on safety is small. The staff approves the revised SRs in TS 3.4.2 based on, 1) consistency with the guidance provided in GL 91-04, 2) historical plant maintenance and surveillance data supporting the conclusion, 3) no definable drift components or any time-based conditions that could appreciably change during the operating cycle, 4) performing the SR would cause unnecessary power transients during power operation, and 4) that the assumptions in the plant licensing basis would not be invalidated as a result of this revision.

3.1.7 SR 3.4.4.2 Safety/Relief Valves (S/RVs)

The surveillance test interval of these SRs is being increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the 25-percent grace period. This SR verifies that the mechanical portions (i.e., solenoids) of the automatic relief function operate as designed when initiated either by an actual or simulated initiation signal.

SR 3.4.4.2 is performed to verify the mechanical portions (i.e., solenoids) of the automatic relief function operate as designed when initiated either by an actual or simulated initiation signal. This is a surveillance for the actuator only and the valve does not move. A manual actuation of each required S/RV (i.e., SR 3.4.4.3) is performed to verify that the valve is functioning properly. The LSFT in SR 3.3.6.4.4 overlaps this SR to provide complete testing of the safety function. Valve operability and the setpoints for overpressure protection are verified, per the American society of Mechanical Engineers (ASME) requirements, prior to valve installation. This verification proves that the valve was actually functioning when installed and that the mechanical valve components were in good condition.

This test requires entry into the drywell to set up test conditions and monitor the energization of the pneumatic solenoids at each SRV being tested. The drywell is not accessible with the plant in operation. As such this SR can only be performed when the plant is in Mode 4 with RPV pressure less than 100 psig or in Mode 5 (refueling). The NRC staff agrees that due to the inaccessibility of these valves, performance of this surveillance during power operation is not possible.

The licensee has stated that a review of the applicable RBS surveillance history has demonstrated that the S/RVs had no previous failures of the TS function that would have been detected solely by the periodic performance of this SR. The NRC staff agrees with the licensee's justification and concludes that the impact of this change on safety is small. The NRC staff approves the revised SRs in TS 3.4.2 based on, 1) consistency with the guidance provided in the GL 91-04, 2) historical plant maintenance and surveillance data supporting the conclusion, 3) the inaccessibility of the S/RVs during power operation, and 4) that the assumptions in the plant licensing basis would not be invalidated as a result of this revision.

3.1.8 TS 3.5.1 / 3.5.2 Emergency Core Cooling System (ECCS)-Operating / ECCS-Shutdown -SR 3.5.1.5, SR 3.5.1.6, SR 3.5.1.8, SR 3.5.2.6

The surveillance test interval of these SRs is being increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the 25-percent grace period. These ECCS and Automatic Depressurization System (ADS) functional tests ensure that a system initiation signal will cause the systems or subsystems to operate as designed.

The licensee stated that the ECCS network has built-in redundancy so that no single failure could prevent the safety function of the ECCS. The pumps and valves are tested quarterly in accordance with the IST Program per SR 3.5.1.4 to verify operability. The tests proposed to be extended need to be performed during outage conditions since they have the potential to initiate an unplanned transient if performed during operating conditions. A review of the applicable plant surveillance history demonstrated that ECCS had no previous failures of the TS functions that would have been detected solely by the periodic performance of these SRs.

The NRC staff reviewed the proposed change and the licensee's justification for the change, and determined that because of the frequent testing of the system and the history of the system performance, the impact of this change on safety is small. The staff approves the revised SRs in TS 3.5.1 and 3.5.2 based on, 1) consistency with the guidance provided in GL 91-04, 2) historical plant maintenance and surveillance data supporting the conclusion, and 3) that the assumptions in the plant licensing basis would not be invalidated as a result of this revision.

3.1.9 TS 3.5.3 Reactor Core Isolation Cooling (RCIC) System - SR 3.5.3.4, SR 3.5.3.5

The surveillance test interval of these SRs is being increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the 25-percent grace period. These RCIC functional tests ensure that the system will operate as designed.

The licensee stated that the pumps and valves are tested quarterly in accordance with the IST Program to verify operability. This testing ensures that the major components of the systems are capable of performing their design function. A review of the applicable plant surveillance history demonstrated that RCIC had no previous failures of these TS functions that would have been detected solely by the periodic performance of these SRs.

The NRC staff reviewed the proposed change and the licensee's justification for the change, and determined that because of the frequent testing of the system and the history of the system performance, the impact of this change on safety is small. The staff approves the revised SRs in TS 3.5.3 based on, 1) consistency with the guidance provided in GL 91-04, 2) historical plant maintenance and surveillance data supporting the conclusion, and 3) that the assumptions in the plant licensing basis would not be invalidated as a result of this revision.

3.1.10 TS 3.6.1.2 Primary Containment Air Locks

> SR 3.6.1.2.4 - Verify, from an initial pressure of 90 psig, the primary containment air lock seal pneumatic system pressure does not decay at a rate equivalent to > 1.50 psig for a period of 24 hours.

The surveillance test interval of this SR is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. An SR exists for verifying air lock seal air flask pressure every 7 days and another SR exists for verifying only one of the two air lock doors can be opened at one time every 184 days. The containment air lock doors are redundant and each door has two (redundant) seals. The amendment request indicated that only one failure of SR 3.6.1.2.4 had occurred during the previous five operating cycles. The cause was determined to be a leaky valve which was repaired. The licensee determined that there was no time-based failure mechanism involved. The amendment request stated that the impact of the interval extension on safety was small.

Based on the redundancy of the doors/seals, their normal operating configuration, the other, more frequent tests and inspections that provide some indication of seal system condition, the infrequency of SR failure and associated maintenance history of the seal pneumatic systems providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.11 TS 3.6.1.3 Primary Containment Isolation Valves (PCIVs)

> SR 3.6.1.3.7 - Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.

The surveillance test interval of this SR is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. An SR exists for exercising these valves and verifying acceptable stroke times in accordance with the IST Program. For most PCIVs this is performed quarterly. These tests provide information about the condition of the PCIVs and much of the actuation circuitry. Most PCIVs are a redundant barrier in a containment penetration. The amendment request indicated that only two failures of SR 3.6.1.3.7 had occurred. One involved a contactor coil and control power fuse in a motor-operated valve control circuit and the other was a failed relay in the RPS trip logic. The failures were described as not repetitive and not associated with a time-based failure mechanism. The amendment request stated that the impact of the interval extension on safety was small.

The NRC staff's conclusion is that extending this SR frequency to once per 24 months is acceptable. This is based on the redundancy of the components involved, the other, more frequent tests that provide some indication of PCIV and actuation circuitry condition, the infrequency of SR failure and associated maintenance history of the PCIVs and associated actuation circuitry providing reasonable assurance that plant safety would not be affected.

> SR 3.6.1.3.8 - Verify in-leakage rate of < 340 scfh (standard cubic feet per hour) for each of the following valve groups when tested at 11.5 psid (pounds per square inch differential) for main steam-positive leakage control system (MS-PLCS) valves.
>
> a. Division I MS-PLCS valves

b. Division II MS-PLCS valves

The surveillance test interval of this SR is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. The amendment request indicated that this SR requires a plant outage to safely perform. The licensee also indicated that no failures have been experienced with the 18-month test frequency. The amendment request stated that the impact of the interval extension on safety was small.

Based on the redundancy of the systems involved and the infrequency of SR failure and associated maintenance history of the PLCS providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.12 SR 3.6.1.6.2 Low-Low Set (LLS) Valves

The surveillance test interval of these SRs is being increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the 25-percent grace period. This SR verifies that the circuitry for the LLS logic is operating properly and will detect significant failures within the instrument loop.

Extending the surveillance test interval for these functional tests is acceptable because the functions are verified to be operating properly by the performance of more frequent Channel Functional Tests (i.e., SR 3.3.6.4.1) and analog trip module calibrations (i.e., SR 3.3.6.4.2).

This more frequent testing ensures that a major portion of the circuitry is operating properly and will detect significant failures within the instrument loop. Additionally, the LLS valves (i.e., safety/relief valves assigned to the LLS logic) are designed to meet applicable reliability, redundancy, single failure, and qualification standards and regulations as described in the RBS USAR.

This test requires entry into the drywell to set up test conditions and monitor the energization of the pneumatic solenoids at each SRV being tested. The drywell is not accessible with the plant in operation. As such this SR can only be performed when the plant is in Mode 4 with RPV pressure less than 100 psig or in Mode 5 (refueling). The NRC staff agrees that due to the inaccessibility of these valves, performance of this surveillance during power operation is not possible.

The licensee has stated that a review of the applicable RBS surveillance history has demonstrated that the LLS valves had no previous failures of the TS function that would have been detected solely by the periodic performance of this SR. The NRC staff agrees with licensee's justification and concludes that the impact of this change on safety is small. The staff approves the revised SRs in TS 3.4.2 based on, 1) consistency with the guidance provided in the GL 91-04, 2) historical plant maintenance and surveillance data supporting the conclusion, 3) the inaccessibility of the S/RVs during power operation, and 4) that the assumptions in the plant licensing-basis would not be invalidated as a result of this revision.

3.1.13 TS 3.6.1.7 Primary Containment Unit Coolers

SR 3.6.1.7.3 - Verify each required primary containment unit cooler actuates throughout its emergency operating sequence on an actual or simulated automatic initiation signal.

The surveillance test interval of this SR is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. An SR exists to verify acceptable flow through the primary containment unit coolers every 92 days. SRs also exist for performing a channel functional test and trip unit calibration every 92 days. The amendment request states that the primary containment unit coolers have built-in redundancy so that no single active failure prevents maintaining primary containment pressure and temperature within design limits following a LOCA with maximum allowable bypass leakage. The licensee indicated that there had been no TS function failures that could have been detected by periodic performance of this SR. The amendment request stated that the impact of the interval extension on safety was small.

Based on the redundancy of the components involved, the other, more frequent SRs that provide some indication of primary containment unit cooler and actuation circuitry condition, the infrequency of SR failure and associated maintenance history of the primary containment unit coolers and associated actuation circuitry providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.14 TS 3.6.1.9 Main Steam-Positive Leakage Control System (MS-PLCS)

SR 3.6.1.9.3 - Perform a system functional test of each MS-PLCS subsystem

The surveillance test interval of this SR is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. An SR exists to verify functioning of the penetration valve leakage control system (PVLCS) compressors every 31 days. The amendment request states that the MS-PLCS subsystems are redundant and designed to perform their safety function given a single active failure. The licensee indicates that no failures of the TS function detectable by periodic performance of this SR have occurred. The licensee stated that the impact of the interval extension on safety was small.

Based on the redundancy of the subsystems and components involved, the other, more frequent SR that provides some indication of main steam penetration leakage control system condition, the infrequency of SR failure and associated maintenance history of the primary containment unit coolers and associated actuation circuitry providing reasonable assurance that impact on plant safety is small, the NRC staff's concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.15 TS 3.6.3.2 Primary Containment and Drywell Hydrogen Igniters

> SR 3.6.3.2.3 - Verify each required igniter in inaccessible areas develops sufficient current draw for a > 1700 °F surface temperature.
>
> SR 3.6.3.2.4 - Verify each required igniter in accessible areas develops a surface temperature of > 1700 °F.

The surveillance test interval of these SRs is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. SRs exist to obtain electrical current versus voltage data to verify the likely proper functioning of the hydrogen igniters every 184 days or, should four or more igniters (in a division of 52 igniters) be inoperable, every 92 days for that division. There are two redundant divisions of igniters in the hydrogen control system. The licensee indicated that one igniter failed in 2003, one failed in 2004, three failed in 2006, and three failed in 2008. The amendment request stated that each failure was unique and not associated with a time-based failure mechanism. The licensee stated that the impact of the interval extension on safety was small.

Based on the redundancy of the system divisions and igniters involved, the other, more frequent SR that provides indication of igniter condition, the infrequency of igniter failures relative to the total number of igniters, and associated maintenance history of the igniters providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.16 TS 3.6.3.3 Containment/Drywell Hydrogen Mixing Systems

> SR 3.6.3.3.2 - Verify each containment/drywell hydrogen mixing subsystem flow rate is ≥ 600 cfm.

The surveillance test interval of this SR is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. Another SR exists that requires each primary containment/drywell hydrogen mixing subsystem be operated at every cold shutdown, if not performed within the previous 92 days. The containment/drywell hydrogen mixing system has built-in redundancy so that no single-failure prevents system operation. The licensee indicated that the surveillance history review showed no failures of the system TS function that would have been detected by the periodic performance of this SR. The licensee stated that the impact of the interval extension on safety was small.

Based on the redundancy of the system, the other potentially more frequent SR that provides some indication of system condition and the infrequency of system failures that this SR could have revealed providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.17 TS 3.6.4.1 Secondary Containment-Operating

SR 3.6.4.1.4 - Verify each standby gas treatment (SGT) subsystem will draw down the shield building annulus and auxiliary building to ≥ 0.5 and ≥ 0.25 inches of vacuum water gauge in ≤ 18.5 and ≤ 34.5 seconds, respectively.

SR 3.6.4.1.6 - Verify each SGT subsystem can maintain > 0.5 and > 0.25 inches of vacuum water gauge in the shield building annulus and auxiliary building, respectively, for 1 hour.

The surveillance test interval of these SRs is to be increased from once every 18 months (on a staggered test basis) to once every 24 months (on a staggered test basis), for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. SRs exist to verify secondary containment equipment hatches are closed and sealed, loop seals are filled, and access doors are closed every 31 days. Another SR exists requiring the verification of shield building annulus and auxiliary building vacuum pressure every 24 hours. The licensee states in the amendment request that no failures of the secondary containment TS function detectable by periodic performance of this SR have occurred during the historical review period. The licensee stated that the impact of the interval extension on safety was small.

Based on the more frequent SRs that provide indication of secondary containment boundary condition, and the infrequency of SR failure providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.18 TS 3.6.4.2 Secondary Containment Isolation Dampers (SCIDs) and Fuel Building Isolation Dampers (FBIDs)

SR 3.6.4.2.2 - Verify each required automatic SCID and FBID actuates to the isolation position on an actual or simulated automatic isolation signal.

The surveillance test interval of this SR is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. An SR exists for exercising these dampers and verifying acceptable isolation stroke times every 92 days. These tests provide information about the condition of the dampers and much of the actuation circuitry. Most dampers provide a redundant barrier in the secondary containment or fuel (handling) building boundary penetrations. The amendment request indicated that no failures of the damper TS function that would have been detectable by the periodic performance of this SR had been experienced during the historical review period. The amendment request stated that the impact of the interval extension on safety was small.

Based on the redundancy of the components involved, the other, more frequent tests that provide some indication of damper and actuation circuitry condition, the infrequency of SR failure and associated maintenance history of the PCIVs and associated actuation circuitry providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.19 TS 3.6.4.3 Standby Gas Treatment (SGT) System

SR 3.6.4.3.3 - Verify each SGT subsystem actuates on an actual or simulated initiation signal.

SR 3.6.4.3.4 - Verify each SGT filter cooling bypass damper can be opened and the fan started.

The surveillance test interval of these SRs is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. An SR exists to operate each SGT subsystem and heaters for ≥ 10 continuous hours every 31 days. The SGT subsystems are redundant and no single failure prevents the safety function of filtering atmosphere discharged from the secondary containment. The licensee states in the amendment request that no failures of the SGT TS function detectable by periodic performance of these SRs have occurred during the historical review period. The licensee stated that the impact of the interval extension on safety was small.

Based on the more frequent SR that provides an indication of the SGT system condition, and the infrequency of the SR failures providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.20 TS 3.6.4.7 Fuel Building Ventilation System - Fuel Handling

SR 3.6.4.7.4 - Verify each fuel building ventilation charcoal filtration subsystem actuates on an actual or simulated initiation signal.

SR 3.6.4.7.5 - Verify each fuel building ventilation charcoal filtration filter cooling bypass damper can be opened and the fan started.

The surveillance test interval of these SRs is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. An SR exists to operate each fuel building ventilation charcoal filtration subsystem and heaters for ≥ 10 continuous hours every 31 days. The fuel building ventilation charcoal filtration subsystems are redundant and no single failure prevents the safety function of mitigating the consequences of a fuel-handling accident involving recently irradiated fuel. The licensee states in the amendment request that no failures of the fuel building ventilation charcoal filtration subsystems' TS function detectable by periodic performance of these SRs have occurred during the historical review period. The licensee stated that the impact of the interval extension on safety was small.

Based on the more frequently performed SR that provides some indication of the fuel building ventilation charcoal filtration system condition, and the infrequency of SR failure providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.21 TS 3.6.5.1 Drywell

> SR 3.6.5.1.2 - Verify from an initial pressure of 75 psig, the personnel door inflatable seal pneumatic system pressure does not decay at a rate equivalent to ≥ 20.0 psig for a period of 24 hours.

The surveillance test interval of this SR is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. An SR exists for verifying the drywell hatch personnel door inflatable seal air flask pressure every 7 days. The drywell hatch personnel door seals are redundant. The amendment request indicated that no failures of this TS function had occurred during the surveillance history period reviewed that could have been detected during periodic performance of this SR. The amendment request stated that the impact of the interval extension on safety was small.

Based on the redundancy of the seals, the other more frequent SR that provides some indication of seal system condition, and the infrequency of SR failures of the associated seal pneumatic system providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.22 TS 3.6.5.2 Drywell Air Lock

> SR 3.6.5.2.5 - Verify from an initial pressure of 75 psig, the drywell air lock seal pneumatic system pressure does not decay at a rate equivalent to > 20.0 psig for a period of 24 hours.

The surveillance test interval of this SR is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. An SR exists for verifying the drywell airlock door inflatable seal air flask pressure every 7 days. The drywell airlock doors and door seals are redundant and at least one door is always kept closed when drywell/containment operability is required. The amendment request indicated that no failures of this TS function had occurred during the surveillance history period reviewed that could have been detected during periodic performance of this SR. The amendment request stated that the impact of the interval extension on safety was small.

Based on the redundancy of the doors/seals, the other more frequent SR that provides some indication of seal system condition, and the infrequency of SR failures of the associated seal pneumatic system providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.23 TS 3.6.5.3 Drywell Isolation Valves

> SR 3.6.5.3.5 Verify each automatic drywell isolation valve actuates to the isolation position on an actual or simulated isolation signal.

The surveillance test interval of this SR is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. SR 3.6.5.3.4 exists for stroke timing and exercising the automatic drywell isolation valves in accordance with the IST Program. The frequency of these stroke time tests is typically quarterly and verifies the functionality of a significant portion of the actuation circuitry as well as the valves. The amendment request indicated that no failures of this TS function had occurred during the surveillance history period reviewed that could have been detected during periodic performance of SR 3.6.5.3.5. The amendment request stated that the impact of the interval extension on safety was small.

Based on the other more frequent SR that provides some indication of isolation valve and actuation circuitry condition and the infrequency of SR failures providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.24 SR 3.7.1 Standby Service Water (SSW) System

The surveillance test interval of these SRs is being increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the 25 percent grace period. This SR verifies that the automatic isolation valves of the SSW system will automatically switch to the safety or emergency position to provide cooling water exclusively to the safety related equipment during an accident.

SR 3.7.1 is performed by use of an actual or simulated initiation signal. This surveillance is implemented as part of integrated ECCS testing, during which it is demonstrated that the SSW system actuates in response to an initiation signal and that the vacuum release valves actuate, the divisional SSW pumps start, the pump discharge valves open, and the divisional isolation valves which separate SSW from normal service water actuate for each subsystem.

The licensee has stated this actuation circuitry for the integrated SSW surveillance is tested only once per cycle. This SR involves a non-instrument calibration surveillance; therefore it does not require an evaluation of the increased calibration interval to 30 months on instrument errors due to instrument drift. NEDC-30936, "BWR Owner's Group Technical Specification Improvement Analyses for ECCS Actuation Instrumentation," showed that the overall safety systems' reliabilities are not dominated by the reliabilities of the logic systems, but by that of the mechanical components. Extending the surveillance test interval for these functional tests is acceptable because more frequent verification of the SSW system pumps and valves are tested quarterly in the IST program or a frequency based upon on a specific IST relief justification. The IST testing ensures that the major mechanical components of the SSW system will be capable of performing their design function. The licensee has reviewed the RBS surveillance history and found only one previous failure of this TS surveillance that would have been detected solely by performance of this surveillance. The failure was related to a failed relay. In addition, performing this SR at power operation causes isolation of the normal plant service water system operation resulting in a severe plant transient.

The NRC staff reviewed the proposed change and the licensee's justification for the change. The staff determined that because of the subsystem testing required by the IST program and the history of the subsystem performance, the impact of this change on safety is small. The

staff approves the revised SR in TS 3.1.7 based on, 1) consistency with the guidance provided in the GL 91-04, 2) historical plant maintenance and surveillance data supporting the conclusion, 3) consistent with ECCS integrated testing frequency which we have approved the SR extension, 4) performing the surveillance would cause an unnecessary plant transient and 5) that the assumptions in the plant licensing-basis would not be invalidated as a result of this revision.

3.1.25 TS 3.7.2 Control Room Fresh Air (CRFA) System

> SR 3.7.2.2 - Perform required CRFA filter testing in accordance with the Ventilation Filter Testing Program (VFTP).
>
> SR 3.7.2.3 - Verify each CRFA subsystem actuates on an actual or simulated initiation signal.
>
> SR 3.7.2.4 - Perform required Control Room Envelope (CRE) unfiltered air in-leakage testing in accordance with CRE Habitability Program.

The surveillance test interval of this SR is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. The amendment request stated that the control room fresh air subsystems are redundant and no single failure would prevent accomplishing their safety function. An SR exists for verifying that both CRFA subsystems are functional by operating them with heaters on for 10 continuous hours every 31 days. The amendment request indicated that no failures of this TS function had occurred during the surveillance history period reviewed that could have been detected during periodic performance of this SR. The amendment request stated that the impact of the interval extension on safety was small.

Based on the redundancy of the CRFA subsystems, the other more frequent SR that provides some indication of system condition, and the infrequency of SR failures of the CRFA subsystems providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.26 TS 3.7.3 Control Room Air Conditioning (AC) System

> SR 3.7.3.1 - Verify each control room AC subsystem has the capability to remove the assumed heat load.

The surveillance test interval of this SR is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. This SR involves a combination of testing and calculation to verify that each control room AC subsystem is capable of removing the heat load assumed in the safety analysis. The amendment request stated that a control room AC subsystem is normally operating and thus most malfunctions are detected and corrected as a matter of routine. The amendment request also indicated that the active components and power supplies are redundant such that a single failure would not prevent the system from accomplishing its safety function. The amendment request indicated that no failures of this TS function had

occurred during the surveillance history period reviewed that could have been detected during periodic performance of this SR. The amendment request stated that the impact of the interval extension on safety was small.

Based on the redundancy of the control room AC subsystems, the monitoring of system during normal operation that provides some indication of system condition, and the infrequency of SR failures of the control room AC subsystems providing reasonable assurance that impact on plant safety is small, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.27 SR 3.7.5 Main Steam Bypass System

SR 3.7.5.2 Perform a system functional test
SR 3.7.5.3 Verify the Turbine Bypass System Response Time is within limits

The main turbine bypass system provides the capability to bypass the turbine with as much as 10 percent of rated steam flow. This function prevents the reactor vessel from exceeding its peak pressure during a turbine trip or load reject scenario in situations where the main steam system is not isolated. The licensee credits the bypass system in transient and accident analyses; however, the system is not safety-grade. The surveillance test interval of these SRs is being increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the 25-percent grace period. This SR ensures that the main turbine bypass valves actuate to their required positions on an actual or simulated initiation signal, and that valve movement occurs within the specified time limits.

SR 3.7.5.2 requires testing of system functionality; SR 3.7.5.3 requires verification of turbine bypass system response time. These SRs require functional logic, and an adequate mechanical response. These SRs involves a non-instrument calibration surveillance; therefore they do not require an evaluation of the increased calibration interval on instrument errors due to instrument drift. NEDC-30936, "BWR Owner's Group Technical Specification Improvement Analyses for ECCS Actuation Instrumentation," showed that the overall safety systems' reliabilities are not dominated by the reliabilities of the logic systems, but by that of the mechanical components. Extending the surveillance test interval for these functional tests is acceptable because more frequent verification of portions of the mechanical components are accomplished by SR 3.7.5.1, which requires that each main turbine bypass valve be completely cycled once every 30 days. SR 3.7.5.1 demonstrates that the valves are mechanically operable and detects significant failures affecting operation. In addition, performing this SR at power operation causes a main turbine trip and the actuation of the Group 6 containment isolation valves resulting in a plant trip.

The licensee has stated that a review of the applicable RBS surveillance history has demonstrated that the Main Steam Bypass system had no previous failures of the TS function that would have been detected solely by the periodic performance of this SR. The NRC staff agrees with licensee's justification and concludes that the impact of this change on safety is small. The staff approves the revised SRs in TS 3.7.5 based on, 1) consistency with the guidance provided in the GL 91-04, 2) historical plant maintenance and surveillance data supporting the conclusion, 3) performing the surveillance would cause an unnecessary plant

trip, and 4) that the assumptions in the plant licensing-basis would not be invalidated as a result of this revision.

3.1.28 Alternating Current (AC) Sources - Operating

SR 3.8.1.8
This SR verifies capability to manual transfer of unit power supply from the normal offsite circuit to the alternate offsite circuit. A note to this SR states that this surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.9
This SR verifies each diesel generator's (DG's) capability to reject the single largest load while maintaining a specified margin to the engine over-speed trip setpoint.

SR 3.8.1.10
This SR verifies each DG's capability, while operating at $\leq$ 0.9 power factor, to reject specified range of loads without tripping and without exceeding specified voltages.

SR 3.8.1.11
This surveillance verifies each DG's capability during an actual or simulated loss-of-offsite power signal.

SR 3.8.1.12
This SR verifies each DG's capability during an actual or simulated emergency core cooling system (ECCS) initiation signal.

SR 3.8.1.13
This SR verifies each DG's noncritical automatic protective trips are bypassed on an actual or simulated ECCS initiation signal and that critical protective functions trip the DG.

SR 3.8.1.14
This SR verifies each DG's capability of operation at $\leq$ 0.9 power factor for $\geq$ 24 hours at specified ranges of loads.

SR 3.8.1.15
This SR verifies capability of each DG to start and achieve the required voltage and frequency within the required time.

SR 3.8.1.16
This SR verifies that the manual synchronization and load transfer from each DG to the offsite source can be made, and that the DG can be returned to ready-to-load status when offsite power is restored.

SR 3.8.17
This SR verifies that an actual or simulated ECCS initiation signal is capable of overriding the test mode feature to return each DG to ready-to-load operation to ensure that the DG availability under accident conditions is not compromised as a result of testing.

SR 3.8.1.18
This SR verifies that for each DG the sequence time is within ± 10 percent of the design for each load sequence timer.

SR 3.8.1.19
This SR verifies capability of each DG during a loss-of-offsite power test signal coincident with an ECCS initiation.

The surveillance test interval of above SRs is being increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the 25-percent grace period. The RBS Class 1E AC distribution system supplies electrical power to three divisional load groups, with each division powered by an independent Class 1E 4.16 kilovolt engineered safety feature (ESF) bus. Each ESF bus has two separate and independent offsite sources of power. Each ESF bus has a dedicated onsite DG. The ESF systems of any two of the three divisions provide for the minimum safety functions necessary to shut down the unit and maintain it in a safe shutdown condition. This design provides substantial redundancy in AC power sources. The DGs are infrequently operated; thus, the risk of wear-related degradation is minimal. Historical testing and surveillance testing during operation prove the ability of the diesel engines to start and operate under various load conditions.

The licensee stated in the LAR that other more frequent testing of the AC sources is performed as follows:

> Verifying correct breaker alignment and indicated power availability for each required offsite circuit every 7 days (i.e., SR 3.8.1.1);
>
> Verifying the DG starting and load-carrying capability is demonstrated every 31 days (i.e., SRs 3.8.1.2 and 3.8.1.3), and ability to continuously supply makeup fuel oil is also demonstrated every 31 days (i.e., SR 3.8.1.6);
>
> Verifying the ability of each DG to reach rated speed and frequency within required time limits every 184 days (i.e., SR 3.8.1.7) will provide prompt identification of any substantial DG degradation or failure;
>
> Verifying the necessary support for DG start and operation as well as verifying the DG factors that are subject to degradation due to aging, such as fuel oil quality, (i.e., SRs 3.8.1.4, 3.8.1.5, 3.8.3.1, 3.8.3.2, 3.8.3.3, and 3.8.3.4) are required every 31 days and/or prior to the addition of new fuel oil.

The licensee stated that based on the above, more frequent testing of the system, Maintenance Rule tracking, system design, and the history of the system performance, the impact of change of SRs intervals on safety, if any, is small.

The staff reviewed the licensee's evaluations, and finds the changes to above SRs intervals from 18 months to 24 months are consistent with GL 91-04, and therefore, acceptable.

3.1.29 Direct Current (DC) Sources - Operating

SR 3.8.4.3
This SR verifies that battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration.

SR 3.8.4.4
This surveillance requires the removal of visible corrosion, and verification that the cell-to-cell and terminal connections are coated with anti-corrosion material.

SR 3.8.4.5
This surveillance requires the battery connection resistance to be verified within acceptable limits.

SR 3.8.4.6
This surveillance requires verification that each division battery charger supplies specified current for greater or equal to 8 hours.

SR 3.8.4.7
This surveillance requires verification that battery capacity is adequate to supply, and maintain in operable status, the required emergency loads for the design duty cycle when subjected to a battery service test.

The surveillance test interval of above SRs on the DC systems is being increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including 25-percent grace period. A review of the applicable River Bend surveillance history demonstrated that the DC electric power subsystem had no previous failures of the TS functions that would have been detected solely by the periodic performance of these SRs. As such, the impact, if any, on system availability is minimal from the proposed change to a 24-month testing frequency. The licensee stated in the LAR that other more frequent testing of the DC sources is performed as follows:

> SR 3.8.4.1 and SR 3.8.6.1 are performed every 7 days to verify battery terminal voltage and pilot cell float voltage, electrolyte level and specific gravity, respectively. SR 3.8.6.2 and SR 3.8.6.3 are performed every 92 days to verify each cell float voltage, each cell electrolyte level, each cell specific gravity, and pilot cell temperature. SR 3.8.4.2 is performed every 92 days to verify no visible battery terminal/connector corrosion or high resistance. These more frequent surveillances will provide prompt identification of any substantial degradation or failure of the battery and/or battery chargers.

The licensee stated that based on the above, more frequent testing of the system, and the history of system performance, the impact of this change on safety, if any, is small. The staff reviewed the licensee's evaluations and finds changes to the above SR intervals from 18 months to 24 months are consistent with GL 91-04, and therefore, acceptable.

3.1.30 5.5.2 Primary Coolant Sources Outside Containment

5.5.2.b Integrated leak test requirements for each system at refueling cycle intervals or less.

TS Section 5.5.2 requires refueling cycle interval (or less) visual inspection and integrated leak testing of portions of systems outside containment that could contain highly radioactive fluids during serious transients or accidents to minimize leakage. While the wording of TS 5.5.2 does not specifically identify a calendar interval and thus does not require any TS wording change, the required interval of these tests will be increased from effectively once every 18 months (current nominal fuel cycle length) to effectively once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. As such the staff has reviewed the bases for this change. The amendment request indicated that during plant operation these systems are visually observed during routine operator and system engineer walkdowns as well as during system operation and testing. Corrective actions would be initiated for any leakage observed. In addition periodic radiological surveys for contamination could also lead to discovery of system leakage. The license amendment also indicated that review of the surveillance test history revealed no failures that would invalidate the conclusion that the impact of the interval extension was small.

The more frequent visual observation of these systems during plant walkdowns, that would likely allow detection of most potential leaks that these specific tests would identify, and the review of the history of this SR, which has infrequently identified any failures, provide reasonable assurance that the impact on plant safety as result of this change is small. Therefore, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.31 TS 5.5.7 – Ventilation Filter Testing Program (VFTP).

SR 3.6.4.7.3 – Perform fuel building ventilation charcoal filter testing in accordance with the Ventilation Filter Testing Program (VFTP).

Exception is being taken to any testing frequencies specified as 18 months in the committed to RG 1.52, Revision 2, wherein testing would be required at a frequency of 24 months. TS Section 5.5.7 requires testing at frequencies specified in Regulatory Guide (RG) 1.52 Revision 2, "Design, Testing, and Maintenance Criteria for Post Accident Engineered-Safety-Feature Atmosphere Cleanup System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants." RG 1.52 Revision 2, Regulatory Position C.5 states that at least once per 18 months an in-place high efficiency particulate air (HEPA) filter (Di-Octyl Phthalate - DOP) penetration test should be performed for filter efficiency and that an in-place test of activated carbon adsorber filters bypass leakage tested with a halogenated hydrocarbon refrigerant. Regulatory Position C.6 states that at least once per 18 months a sample of the activated carbon adsorber should be laboratory tested for iodine decontamination efficiency. The required interval of these tests is to be increased from once every 18 months to once every 24 months, for a maximum interval of 30 months including the TS SR 3.0.2 allowed 25-percent interval extension. These tests of the ESF ventilation systems filter units verify that they remain capable of providing the designed protection from airborne radionuclides. The amendment request indicated that no failures of this TS function had occurred during the surveillance history

period reviewed that could have been detected during periodic performance of these tests and that these tests would continue to be performed based on the operating conditions or events as described in RG 1.52 Revision 2. The amendment request stated that the impact of the interval extension on safety was small.

Based on the infrequency of failure of these tests providing reasonable assurance that impact on plant safety is small and that in Revision 3 of RG 1.52 in 2001 the general acceptability of this longer test interval was recognized with the change in the recommended frequency to at least once each 24 months, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.1.32 TS 5.5.14 – Control Room Envelope Habitability Program.

Item "d." of this section is to be revised to change the required frequency for measurement of the CRE pressure relative to the pressure of adjacent areas while in the pressurization mode from 18 months to 24 months.

TS Section 5.5.14 was added to the TS as part of License Amendment 154 dated November 16, 2007, when adopting Technical Specification Task Force (TSTF)-448, Revision 3, "Control room Envelope Habitability" using the consolidated line-item improvement process. The TSTF model amendment wording allowed for plant-specific selection of an appropriate frequency for performing a test involving measurement of the CRE pressure relative to all external areas adjacent to the CRE during the pressurization mode of operation by one subsystem of the control room fresh air (CRFA) system. The intervals determined to be acceptable were generally the operating cycle length of each nuclear unit as an operational practicality, and as they had previously been performed as a regular TS SR for most nuclear units. TSTF-448 also included a new provision for periodic in-leakage testing of the CRE by tracer gas with the recognition that the differential pressure test was not adequate in verifying acceptable in-leakage, but would provide some useful data for monitoring the CRE boundary condition on a more frequent period than the tracer gas in-leakage testing. The LAR also included a change to TS 5.5.14 Paragraph "c." to ensure that any testing identified in RG 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors", as being at a frequency of 18 months be allowed at a frequency of 24 months. RG 1.197 does not identify a periodic test frequency of 18 months, just a period of 3 years between in-leakage tests after an in-leakage test failure or 6 years after an acceptable in-leakage test. The self assessment is required within 3 years of the last successful in-leakage test. RG 1.197 also provides for condition or event based testing when changes are made to SSCs that could impact CRE integrity or present a new limiting condition. Performance of the CRE boundary condition assessment at a 24-month frequency is consistent with the guidance of RG 1.197. The amendment request stated that the impact of the interval extension on safety was small.

Based on the data obtained by the tests, the periodic tracer gas in-leakage tests, and the continued provision for the condition or event-based testing, the NRC staff concludes that extending this SR frequency to once per 24 months is acceptable and is consistent with the guidance provided in GL 91-04.

3.2 Calibration-Related Changes

GL 91-04 requires that licensees address instrument drift when proposing to extend the SR calibration interval. The licensee provided a detailed methodology for drift evaluation performed to support the 24-month fuel cycle extension in Entergy Engineering Report No. ECH-NE-08-00015, "Instrument Drift Analysis Design Guide," Revision 0, dated July 23, 2008 (Attachment 6 to the LAR (RBG-46932)). This drift evaluation is primarily based on Electric Power Research Institute (EPRI) Technical Report (TR)-103335, "Statistical Analysis of Instrumentation Calibration Data," Revision 1, issued October 1998. Earlier, by letter dated December 1, 1997, the NRC provided "Status Report on the Staff Review of EPRI Technical Report TR-103335, 'Guidelines for Instrument Calibration Extension/Reduction Programs,' dated March 1994."

The licensee reviewed the surveillance test history of the affected instrumentation, including, where appropriate, an instrument drift study. It calculated instrument drift by subtracting the previous as-left parameter from the observed as-found parameter. In performing the historical evaluation, the licensee collected recoded channel calibration data for associated instruments for at least five operating cycles before and including the spring 2008 refueling outage. The licensee stated that the failure history evaluation and drift study found that the instrument drift has not exceeded the current TS allowable value, except for the SR test failures discussed in Attachment 5 to the LAR. The licensee further stated that the magnitude of the instrument drift has been calculated with a high degree of confidence and a high degree of probability (at least 95/95 percent) for a bounding calibration interval of 30 months for each instrument make, model, and range.

The licensee compared the projected drift values for the 24-month extension to the design allowances calculated in the associated instrument setpoint analysis. When the projected drift for an instrument fell outside the existing calculation design allowances, the licensee performed an analysis of the setpoint, allowable value, or analytical limit, or a combination. The licensee also stated that it performed revised setpoint calculations in accordance with RG 1.105, Part I of ISA Standard 67.04, and Part II of ISA RP67.04, "Methodologies for the Determination of Set Points for Nuclear Safety-Related Instrumentation," issued 1994.

As indicated in Attachment 6 to the LAR, the licensee performed categorization of calibration data, analysis of outliers, assessment of the normality of data, analysis of the time-dependency of the data, determination of drift bias, and calculation of analyzed drift value. The licensee provided the results of this study for Barksdale Model TC9622-3 pressure switches in Calculation No. G13.18.6.3-011, Revision 0, dated February 13, 2009. The licensee concluded that there was no time dependency in the drift data, but, to be conservative, it treated the drift data as moderately time dependent for the purpose of extrapolation.

The licensee performed the drift evaluation as documented in Attachment 6 to the LAR. This drift analysis is largely based on EPRI TR-103335, Revision 1, which includes commonly used statistical methods and procedures for data, outlier, and time-dependency analyses as they are applied to setpoint and calibration problems. The EPRI report also includes methods for testing for the normality of data. The staff finds the procedures and methods described in Attachment 6 to the LAR and the 1998 EPRI report acceptable for the reasons described in the paragraphs below.

The licensee based its decision to remove a value as an outlier—at the 5-percent level of significance (a level of significance often used in general statistical practice)—on results in a 1971 paper by Frank E. Grubbs and Glenn Beck, "Extension of Sample Sizes and Percentage Points for Significance Tests of Outlying Observations." (The EPRI report references an earlier paper on the topic of outlying observations by Grubbs alone.) EPRI TR-103335, Revision 1, refers to the American Society for Testing and Materials Standard E178, which in turn references the Grubbs and Beck paper. This method—the extreme studentized deviate method—for determining outliers is appropriate for this analysis. Therefore, the NRC staff finds this approach to be acceptable.

Furthermore, the staff reviewed the licensee's procedure for assessing the normality of the drift data and finds it acceptable. The license described several methods (tests) for assessing the normality of data in Attachment 6 to the LAR: chi-squared ($\chi^2$) goodness-of-fit test, W-Test, D-prime (D') test, probability plots, and coverage analysis. Since the sample size was less than 50, the most appropriate test was the W-Test (based on a 1965 paper by S. S. Shapiro and M. B. Wilk). The staff used the information provided in the *Handbook of Statistical Methods for Engineers and Scientists* by Harrison M. Wadsworth (McGraw-Hill, Inc., 1990) and American National Standards Institute Standard N15.15-1974, "American National Standard Assessment of the Assumption of Normality Employing Individual Observed Values," both of which describe the W-Test for the normality of data, and finds the approach used by the licensee to be acceptable. Other tests for normality were not necessary in this case.

The licensee performed a time-dependency analysis of drift data that covers a time period from 15 to 23 months with a mean time of 594 days (about 20 months), which resulted in a limited time-dependency analysis. There was no evidence of time dependency over this period, leading to the licensee's decision to use a conservative approach and treat the drift data as moderately time-dependent for the purpose of extrapolation.

A scatter plot of the data seemed to indicate that some negative drift occurred over time, again leading the licensee to use a more conservative approach to determining whether there was an "actual" bias term. In this case, the bias term—indicating "negative drift"—would have been shown to exist even if the licensee had used the less conservative approach.

The NRC staff reviewed the approach used to develop the tolerance intervals and found it to be applied correctly (based on material in the Wadsworth book cited above and other sources). In addition, by using the tolerance interval factor of 2.490 for a sample size of 35, rather than the actual tolerance interval factor for the final data set size of 38, the licensee made a more conservative decision compared to interpolating between sample sizes of 35 and 40. The NRC staff finds this acceptable.

The staff reviewed in detail a specific calculation ("Drift Study for Barksdale Model TC9622-3 Pressure Switches") to determine if the licensee performed the computations correctly and according to methods described in Attachment 6 to the LAR and the 1998 EPRI report. While reviewing Attachment 6, the staff discovered that in one of the tables (Table 4, "Maximum Values of Non-Biased Mean") cited in the calculation, the approach chosen was more conservative than necessary. Therefore, the NRC staff concludes that the licensee's drift evaluation is acceptable.

In response to the staff's request for additional information, by letter dated August 17, 2010, the licensee stated that none of the drift values calculated in support of the 24-month fuel cycle is outside the existing design-basis allowances as established by the safety system supplier. Furthermore, the licensee stated that the original calculations, subsequent revisions (including those made in support of the 24-month fuel cycle), and the methods of calibration continue to confirm that the existing TS allowable values and Technical Requirement Manual NTSPs are conservative with respect to the original design basis. The licensee also stated that the surveillance procedure as-found limits include the setting tolerance but not any other allowances for uncertainty. Setting tolerances are normally based on instrument reference accuracies, but they are sometimes based on limitations in supplier design documents if those are more restrictive. If the surveillance finds an instrument loop calibration outside the as-found tolerance, a condition report is written.

The staff concludes that the licensee has conservatively used the as-found tolerance to be the same as the as-left tolerance, and there is no change in any allowable value in the TS or in any NTSP value in the plant Technical Requirements Manual because of implementation of the 24-month fuel cycle. Based on these considerations, the NRC staff finds the proposed LAR acceptable.

## 4.0 SUMMARY

The NRC staff has reviewed the licensee's request of proposed revisions to the TS SRs to support the implementation of a 24-month fuel cycle for the RBS. The proposed LAR was evaluated by the staff to determine whether applicable regulations and requirements continue to be met. It was determined that the proposed changes do not require any exemptions or relief from regulatory requirements, other than the TSs. Applicable regulatory requirements will continue to be met, adequate defense-in-depth will be maintained, and sufficient safety margins will be maintained.

The NRC staff finds the licensee's proposed TS changes to be acceptable based on existing applicable regulations, NRC guidance and reasonable assurance that the impact of the interval extensions on safety would be small.

## 5.0 REGULATORY COMMITMENTS

In support of the proposed application, the licensee provided in its August 10, 2009, submittal the following regulatory commitment:

> 1) RBS setpoint calculations, and affected calibration and functional test procedures, have been revised, or will be revised prior to implementation to reflect the new 30-month drift values.
>
> 2) The weight of the Boron-10 contained in the SLC tank, minimum required available solution volume, will be increased from 143 lbm to 170 lbm to ensure adequate margin for future core designs.
>
> 3) RBS will initiate a change to offsite power requirements to ensure that grid voltage is no lower than 97.5 percent per unit, up from the current limit of 95 percent per unit. This

change will result in an increase in minimum grid voltage operability limit from 95 percent per unit to 97.5 percent per unit and a new MCR alarm set point for Low Grid Voltage of 98.2 percent, up from 98 percent.

4) Instruments with TS calibration surveillance frequencies extended to 24 months will be monitored and trended. As-found and as-left calibration data will be recorded for each 24-month calibration activity for a period of three cycles.

5) Additionally, upon approval of this amendment request, commitments outlined in the RBS USAR related to RG 1.32, "Criteria for Safety-Related Electric Power Systems for Nuclear Power Plants," RG 1.129, "Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," and to IEEE-450, "Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," to perform the battery service test (i.e., SR 3.8.4.3) during refueling outages, or at some other outage, with intervals between tests "not to exceed 18 months," will be revised to reflect intervals between tests "not to exceed 30 months."

[Since the current plant setpoints for both of these [degraded voltage] functions will not be conservative for this change, the new calculated nominal trip setpoints will be revised in the Amendment Technical Requirements Manual.]

[The following information will be added for the Loss of Power degraded voltage function: "There is a plant-specific program which verifies that this instrument channel functions as required by verifying the As-Left and As-Found settings are consistent with those established by the setpoint methodology."]

By letter dated June 16, 2010, Entergy withdrew its proposed changes to TS 3.3.8 regarding the change to the degraded voltage instrumentation allowable values as indicated on Table 3.3.8.1-1 and to extend the SR 3.3.8.1.3 from 18 to 24 months. As such commitments 3 and part of 5 (in brackets) are no longer needed. The licensee committed to complete commitments 1, 2, 4, and 5 (non-bracketed) upon the implementation of the TS amendment. The NRC concludes this commitment is acceptable.

## 6.0 STATE CONSULTATION

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

## 7.0 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 and changes surveillance requirements. 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 published in the *Federal Register* on October 20, 2009 (74 FR 53776).

The amendment also relates to changes in recordkeeping, reporting, or administrative procedures or requirements. Accordingly, the amendment meets the eligibility criteria for categorical exclusions set forth in 10 CFR 51.22(c)(9) and (c)(10). 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.

## 7.0 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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Date: August 31, 2010

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

Sincerely,

/RA/

Alan B. Wang, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-458

Enclosures:
1. Amendment No. 168 to NPF-47
2. Safety Evaluation

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