

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

March 4, 2011

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Serial No. 11-086
NL&OS/ETS R1
Docket Nos. 50-280/281
License Nos. DPR-32/37

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
SURRY POWER STATION UNITS 1 AND 2
SUPPLEMENTAL INFORMATION AND TYPED TS PAGES FOR PROPOSED
LICENSE AMENDMENT REQUEST REGARDING RISK-INFORMED JUSTIFICATION
FOR THE RELOCATION OF SPECIFIC SURVEILLANCE FREQUENCY
REQUIREMENTS TO A LICENSEE CONTROLLED PROGRAM (ADOPTION OF
TSTF-425, REVISION 3)

In a March 30, 2010 letter (Serial No. 10-183), Dominion requested amendments, in the form of changes to the Technical Specifications (TS) to Facility Operating License Numbers DPR-32 and DPR-37, for Surry Power Station Units 1 and 2, respectively. The proposed amendments would modify Surry TS by relocating specific surveillance frequencies to a licensee-controlled program with the implementation of Nuclear Energy Institute (NEI) 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies." Supplemental information related to the license amendment was provided in an August 23, 2010 letter (Serial No. 10-183A). The March 30, 2010 and August 23, 2010 letters did not contain the typed TS pages as required by the Model Application for TSTF-425. The typed TS pages were not provided since other previously submitted license amendment request reviews were expected to be concluded during the review period that could affect the content or pagination of the typed TS pages.

Consistent with the Model Application for TSTF-425, Dominion is providing the typed TS pages for the proposed change to relocate surveillance frequencies from TS. The TS amendments approved during the review period did not affect any surveillance requirement or associated frequencies included in the March 30, 2010 and August 23, 2010 submittals, however some TS pages were affected.

In the March 30, 2010 letter, Dominion had requested 120 days for implementation following approval. However, that implementation schedule was predicated on applying corporate and station engineering resources to the development of related required programs prior to the amendment approval. Due to the diversion of engineering resources during the refueling outage at Surry and a two unit outage at North Anna in the fall of 2010, coupled with the NRC review and approval of the amendment request being anticipated earlier than the requested approval date, preparatory implementation

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ATTACHMENT 1

DISCUSSION OF ADMINISTRATIVE/EDITORIAL CHANGES

**PROPOSED LICENSE AMENDMENT REQUEST REGARDING RISK-INFORMED
JUSTIFICATION FOR THE RELOCATION OF SPECIFIC SURVEILLANCE FREQUENCY
REQUIREMENTS TO A LICENSEE CONTROLLED PROGRAM**

**VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
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Discussion of Administrative/Editorial Changes

During the review of the typed pages for submittal the following items were identified as additional changes that should be considered for consistency and avoid potential future conflict or confusion with the submitted proposed change, as well as addressing changes due to amendments issued since the March 30, 2010 and August 23, 2010 submittals. Submittal of these changes was discussed with Ms. Karen Cotton of the NRC on March 3, 2011. These changes, which are identified by a different style (dashed lines) of strikethroughs and text blocks, are included in revised marked-up pages in Attachment 2. The Surry typed pages are included Attachment 3. The following additional administrative/editorial changes are proposed for inclusion at this time:

- TS page 4.1-4 – Bases – The second sentence of the first paragraph is revised to include the phrase “frequencies are controlled under the Surveillance Frequency Control Program” and delete “performed at the minimum frequencies are sufficient to demonstrate this capacity.”

Justification: This change is proposed for consistency with implementing the Surveillance Frequency Control Program.

- TS pages 4.1-5 and 4.1-5a- Bases -
 - Last paragraph of Pressurizer PORV, PORV Block Valve, and PORV Backup Air Supply Section – The word “quarterly” is removed from the third sentence of this paragraph.

Justification: This change is proposed for consistency with implementing the Surveillance Frequency Control Program.

- First sentence of RCS Flow Section – The first sentence of the paragraph is deleted and replaced with the sentence “The Surveillance frequency is controlled under the Surveillance Frequency Control Program” located at the end of the paragraph.

Justification: This change includes changes associates with Amendment 270/269 which occurred since the March 30, 2010 and August 23, 2010 submittal.

- TS page 4.1-8 – Item 26, Logic Channel Testing – The word “monthly” is removed from Notes 1 and 2 and replaced with “periodic” in Note 2.

Justification: This change is proposed for consistency with implementing the Surveillance Frequency Control Program.

- TS page 4.1-8a – Item 32, Auxiliary Feedwater – The word “quarterly” is removed from Note 1 and replaced with “periodic.”

Justification: This change is proposed for consistency with implementing the Surveillance Frequency Control Program.

- TS page 4.11-1 – TS 4.11.B – The phrase “or as specified below” is included in the sentence after the word Program.

Justification: This change is proposed for clarity to avoid potential confusion in application of the Specification.

- TS page 4.11-2 – The Note for TS 4.11.B.2.b is revised to include the TS number in the note.

Justification: This change is proposed for clarity to avoid potential confusion in application of the Specification.

- TS page 4.12-1 – TS 4.12.A - The phrase “or as specified below” is inserted.

Justification: This change is proposed for clarity to avoid potential confusion in application of the Specification.

- TS page 4.12-4 – Item 9 is revised to put the action verb “Check” at the beginning of the sentence and the phrase “shall be checked” at the end of the sentence is deleted.

Justification: This change is editorial and is proposed to provide consistency in the language within this Specification.

These changes are administrative/editorial in nature, do not remove any additional surveillance frequencies, and do not impact any surveillance frequencies that remain in TS. These changes are consistent with the March 30, 2010 and August 23, 2010 submittals and represent additional clarification to facilitate conformance with the originally submitted proposed changes. Therefore, the information provided in this letter does not affect the conclusion of the significant hazards consideration discussion provided in the Dominion letter dated March 30, 2010 (Serial No. 10-183) for Surry.

ATTACHMENT 2

REVISED MARKED-UP TECHNICAL SPECIFICATION PAGES

**PROPOSED LICENSE AMENDMENT REQUEST REGARDING RISK-INFORMED
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**VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
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frequencies are controlled under the Surveillance Frequency Control Program

The surveillance requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability. Specific surveillance intervals and surveillance and maintenance outage times have been determined in accordance with ~~WCAP-10271, EVALUATION OF SURVEILLANCE FREQUENCIES AND OUT OF SERVICE TIMES FOR THE REACTOR TRIP INSTRUMENTATION SYSTEM, and supplements to that report, WCAP-10271 Supplement 2, EVALUATION OF SURVEILLANCE FREQUENCIES AND OUT OF SERVICE TIMES FOR THE ENGINEERED SAFETY FEATURES ACTUATION SYSTEM, and supplements to that report, and WCAP-14333P, PROBABILISTIC RISK ANALYSIS OF THE RPS AND ESF TEST TIMES AND COMPLETION TIMES, as approved by the NRC and documented in SERS dated February 21, 1985, February 22, 1989, the SSER dated April 30, 1990 for WCAP-10271 and July 15, 1998 for WCAP-14333P. For those functional units not included in the generic Westinghouse probabilistic risk analyses discussed above, a plant specific risk assessment was performed. This risk assessment demonstrates that the effect on core damage frequency and incremental change in core damage probability is negligible for the relaxations associated with the additional functional units.~~

Surveillance testing of instrument channels is routinely performed with the channel in the tripped condition. Only those instrument channels with hardware permanently installed that permits bypassing without lifting a lead or installing a jumper are routinely tested in the bypass condition. However, an inoperable channel may be bypassed by lifting a lead or installing a jumper to permit surveillance testing of another instrument channel of the same functional unit.

at the frequency specified in the Surveillance Frequency Control Program

The refueling water storage tank is sampled weekly for Cl^- and/or F^- contaminations. Weekly sampling is adequate to detect any inleakage of contaminated water.

Main Control Room/Emergency Switchgear Room (MCR/ESGR) Envelope Isolation Actuation Instrumentation

The MCR/ESGR Envelope Isolation Actuation function provides a protected environment from which operators can control the unit following an uncontrolled release of radioactivity. A functional check of the Manual Actuation function is performed every 18 months. ~~The test frequency is based on the known reliability of the function and the redundancy available and has been shown to be acceptable through operating experience.~~ The Surveillance Requirement will ensure that the two trains of the MCR/ESGR envelope isolation dampers close upon manual actuation of the MCR/ESGR Envelope Isolation Actuation Instrumentation and that the supply and exhaust fans in the normal ventilation system for the MCR/ESGR envelope shut down, as well as adjacent area ventilation fans. Automatic actuation of the MCR/ESGR Envelope Isolation Actuation Instrumentation is confirmed as part of the Logic Channel Testing for the Safety Injection system.

Pressurizer PORV, PORV Block Valve, and PORV Backup Air Supply

The safety-related, seismic PORV backup air supply is relied upon for two functions - mitigation of a design basis steam generator tube rupture accident and low temperature overpressure protection (LTOP) of the reactor vessel during startup and shutdown. The surveillance criteria are based upon the more limiting requirements for the backup air supply (i.e. more PORV cycles potentially required to perform the mitigation function), which are associated with the LTOP function.

The PORV backup air supply system is provided with a calibrated alarm for low air pressure. The alarm is located in the control room. Failures such as regulator drift and air leaks which result in low pressure can be easily recognized by alarm or annunciator action. A periodic ~~quarterly~~ verification of air pressure against the surveillance limit supplements this type of built-in surveillance. Based on experience in operation, the minimum checking frequencies set forth are deemed adequate.

RCS Flow

~~The frequency of 18 months for RCS flow surveillance reflects the importance of verifying flow after a refueling outage when the core has been altered, which may~~

Amendment Nos. 270 and 269

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~have caused an alteration of the flow resistance.~~ This surveillance requirement in Table 4.1-2A is modified by a note that allows entry into POWER OPERATION, without having performed the surveillance, and placement of the unit in the best condition for performing the surveillance. The note states that the surveillance requirement is not required to be performed until 7 days after reaching a THERMAL POWER of $\geq 90\%$ of RATED POWER. The 7 day period after reaching 90% of RATED POWER is reasonable to establish stable operating conditions, install the test equipment, perform the test, and analyze the results. The surveillance shall be performed within 7 days after reaching 90% of RATED POWER.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Replace each marked through surveillance frequency in the Check, Calibrate, and Test columns with "SFCP"

TABLE 4.1-1(Continued)
MINIMUM FREQUENCIES FOR CHECK, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

<u>Channel Description</u>	<u>Check</u>	<u>Calibrate</u>	<u>Test</u>	<u>Remarks</u>
23. Turbine First Stage Pressure	S	R	Q	
24. Deleted				
25. Deleted				
26. Logic Channel Testing	N.A.	N.A.	M (1)(2)	1) Reactor protection, safety injection and the consequence limiting safeguards system logic are tested monthly per this line item. 2) The master and slave relays are not included in the monthly logic channel test of the safety injection system.
27. Deleted				periodic
28. Turbine Trip				Setpoint verification is not applicable
A. Stop valve closure	N.A.	N.A.	P	
B. Low fluid oil pressure	N.A.	N.A.	P	
29. Deleted				
30. Reactor Trip Breaker	N.A.	N.A.	M	The test shall independently verify operability of the undervoltage and shunt trip attachments
31. Deleted				

Amendment Nos. 228 and 228

TS 4.1-8
08-31-01

Replace each marked through surveillance frequency in the Check, Calibrate, and Test columns with "SFCP"

TABLE 4.1-1 (Continued)
 MINIMUM FREQUENCIES FOR CHECK, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

Channel Description	Check	Calibrate	Test	Remarks
32. Auxiliary Feedwater				
a. Steam Generator Water Level Low-Low	S	R	Q(1)	1) The auto start of the turbine driven pump is not included in the quarterly ^{periodic} test, but is tested within 31 days prior to each startup.
b. RCP Undervoltage	S	R	R(1)(2)	1) The actuation logic and relays are tested within 31 days prior to each startup. 2) Setpoint verification not required.
c. S.I.	(All Safety Injection surveillance requirements)			
d. Station Blackout	N.A.	R	N.A.	
e. Main Feedwater Pump Trip	N.A.	N.A.	R	
33. Loss of Power				
a. 4.16 KV Emergency Bus Undervoltage (Loss of Voltage)	N.A.	R	Q (1)	1) Setpoint verification not required.
b. 4.16 KV Emergency Bus Undervoltage (Degraded Voltage)	N.A.	R	Q (1)	1) Setpoint verification not required.
34. Deleted				
35. Manual Reactor Trip	N.A.	N.A.	R	The test shall independently verify the operability of the undervoltage and shunt trip attachments for the manual reactor trip function. The test shall also verify the operability of the bypass breaker trip circuit.
36. Reactor Trip Bypass Breaker	N.A.	N.A.	M (1), R (2)	1) Remote manual undervoltage trip immediately after placing the bypass breaker into service, but prior to commencing reactor trip system testing or required maintenance. 2) Automatic undervoltage trip.
37. Safety Injection Input to RPS	N.A.	N.A.	R	
38. Reactor Coolant Pump Breaker Position Trip	N.A.	N.A.	R	

Amendment Nos. 236 and 237

TS 4.1-8a
12-16-03

4.11 SAFETY INJECTION SYSTEM TESTS

Applicability

Applies to the operational testing of the Safety Injection System.

Objective

at the frequency specified in the Surveillance Frequency Control Program by

To verify that the Safety Injection System will respond promptly and perform its design functions, if required.

Specifications

is within specified limits.

A. The refueling water storage tank (RWST) shall be demonstrated OPERABLE:

1. ~~At least once per day by~~ verifying the RWST solution temperature.

Verifying:

2. ~~At least once per week by:~~

are within specified limits.

a. ~~Verifying the~~ RWST contained borated water volume, and

b. ~~Verifying the~~ RWST boron concentration

B. Each safety injection accumulator shall be demonstrated OPERABLE:

Verifying:

1. ~~At least once per 12 hours by:~~

at the frequency specified in the Surveillance Frequency Control Program or as specified below by

a. ~~Verifying the~~ contained borated water volume ~~is within specified limits,~~ and

b. ~~Verifying the~~ nitrogen cover-pressure ~~is within specified limits.~~

are

Verifying:

a. the boron concentration of the accumulator solution is within specified limits, and

b.

2. At least once per 31 days and within 6 hours after each solution volume increase of greater than or equal to 1% of tank volume by verifying the boron concentration of the accumulator solution.

Note: This surveillance is not required when the volume increase makeup source is the RWST. 4.11.B.2.b

C. Each Safety Injection Subsystem shall be demonstrated OPERABLE:

- 1. By verifying, that on recirculation flow, each low head safety injection pump performs satisfactorily when tested in accordance with the Inservice Testing Program.
- 2. By verifying that each charging pump performs satisfactorily when tested in accordance with the Inservice Testing Program.
- 3. By verifying that each motor-operated valve in the safety injection flow path performs satisfactorily when tested in accordance with the Inservice Testing Program.

4. Prior to POWER OPERATION by:

at the frequency specified in the Surveillance Frequency Control Program unless otherwise noted below by

- a. Verifying that the following motor operated valves are blocked open by de-energizing AC power to the valves motor operator and tagging the breaker in the off position:

<u>Unit 1</u>	<u>Unit 2</u>
MOV-1890C	MOV-2890C

- b. Verifying that the following motor operated valves are blocked closed by de-energizing AC power to the valves motor operator and the breaker is locked, sealed or otherwise secured in the off position:

<u>Unit 1</u>	<u>Unit 2</u>
MOV-1869A	MOV-2869A
MOV-1869B	MOV-2869B
MOV-1890A	MOV-2890A
MOV-1890B	MOV-2890B

4.12 AUXILIARY VENTILATION EXHAUST FILTER TRAINS

Applicability

Applies to the testing of safety-related air filtration systems.

Objective

To verify that leakage efficiency and iodine removal efficiency are within acceptable limits.

Specifications

The following Tests shall be performed at the frequencies specified in the Surveillance Frequency Control Program or as specified below and as required for the conditions identified below:

A. Tests and Frequency

1. ~~Each redundant filter train circuit shall be operated every month if it has not already been in operation.~~

Operate

2. ~~Once per 18 months, the operability of the entire safety-related portion of the auxiliary ventilation system shall be demonstrated.~~

Demonstrate

3. ~~Auxiliary ventilation system exhaust fan flow rate through each filter train in the LOCA mode of operation shall be determined initially, after any structural maintenance on the HEPA filter or charcoal adsorber housings, once per 18 months, or after partial or complete replacement of the HEPA filters or charcoal adsorbers.~~

Determine

The procedure for determining the air flow rate shall be in accordance with Section 9 of the ACGIH Industrial Ventilation document and Section 8 of ANSI N510-1975.

4. ~~A visual inspection of the filter train and associated components shall be conducted before each in-place air flow distribution test, DOP test, or activated charcoal adsorber leak test in accordance with the intent of Section 5 of ANSI N510-1975.~~

Conduct

Check

9. The pressure drop across the HEPA filter and adsorber banks shall be checked:

- a. Initially;
- b. Once per 18 months thereafter for systems maintained in a standby status and after 720 hours of system operation; and +
- c. After each complete or partial replacement of filters or adsorbers.

B. Acceptance Criteria

1. The minimum period of air flow through the filters shall be 15 minutes ~~per month~~.
2. The system operability test of Specification 4.12.A.2 shall demonstrate automatic start-up, shutdown and flow path alignment.
3. The air flow rate determined in Specification 4.12.A.3 shall be:
 - a. 36,000 cfm \pm 10 percent with system in the LOCA mode of operation.
 - b. The ventilation system shall be adjusted until the above limit is met.
4. Air distribution test across the prefilter-bank shall show uniformity of air velocity within \pm 20 percent of average velocity. The ventilation system shall be adjusted until the limit is met.

ATTACHMENT 3

TYPED TECHNICAL SPECIFICATION PAGES

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**VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
SURRY POWER STATION UNITS 1 AND 2**

4.1 OPERATIONAL SAFETY REVIEW

Applicability

Applies to items directly related to safety limits and limiting conditions for operation.

Objective

To specify the minimum frequency and type of surveillance to be applied to unit equipment and conditions.

Specification

- A. Calibration, testing, and checking of instrumentation channels and interlocks shall be performed as detailed in Tables 4.1-1, 4.1-1A, and 4.1-2 and at the frequencies specified in the Surveillance Frequency Control Program, unless otherwise noted in the Tables.
- B. Equipment tests shall be performed as detailed in Table 4.1-2A and at the frequencies specified in the Surveillance Frequency Control Program, unless otherwise noted in the Tables and as detailed below.
 1. In addition to the requirements of the Inservice Testing Program, each Pressurizer PORV and block valve shall be demonstrated OPERABLE at the frequencies specified in the Surveillance Frequency Control Program by:
 - a. Performing a complete cycle of each PORV with the reactor coolant average temperature $>350^{\circ}\text{F}$.
 - b. Performing a complete cycle of the solenoid air control valve and check valves on the air accumulators in the PORV control system.
 - c. Operating each block valve through one complete cycle of travel. This surveillance is not required if the block valve is closed in accordance with 3.1.6.a, b, or c.
 - d. Verifying that the pressure in the PORV backup air supply is greater than the surveillance limit.
 - e. Performing functional testing and calibration of the PORV backup air supply instrumentation and alarm setpoints.

2. The pressurizer water volume shall be determined to be within its limit as defined in Specification 2.3.A.3.a at least once per 12 hours whenever the reactor is not subcritical by at least 1% $\Delta k/k$.
 3. Each Reactor Vessel Head vent path remote operating isolation valve not required to be closed by Specification 3.1.A.7a or 3.1.A.7b shall be demonstrated OPERABLE at each COLD SHUTDOWN but not more often than once per 92 days by operating the valve through one complete cycle of full travel from the control room.
 4. Each Reactor Vessel Head vent path shall be demonstrated OPERABLE following each refueling by:
 - a. Verifying the manual isolation valves in each vent path are locked in the open position.
 - b. Cycling each remote operating isolation valve through at least one complete cycle of full travel from the control room.
 - c. Verifying flow through the reactor vessel head vent system vent paths.
- C. Sampling tests shall be conducted as detailed in Table 4.1-2B and at the frequencies specified in the Surveillance Frequency Control Program, unless otherwise noted in the Table.
- D. Whenever containment integrity is not required, only the asterisked items in Table 4.1-1 and 4.1-2A and 4.1-2B are applicable.
- E. Flushing of wetted sensitized stainless steel pipe sections as identified in the Basis Section shall be conducted only if the RWST Water Chemistry exceeds 0.15 PPM chlorides and/or fluorides (Cl^- and or F^-). Flushing of sensitized stainless steel pipe sections shall be conducted as detailed in TS Table 4.1-3A and 4.1-3B.

F. Containment Ventilation Purge System isolation valves:

1. The outside Containment Ventilation Purge System isolation valves and the isolation valve in the containment vacuum ejector suction line outside containment shall be determined locked, sealed, or otherwise secured in the closed position at the frequency specified in the Surveillance Frequency Control Program.
2. The inside Containment Ventilation Purge System isolation valves and the isolation valve in the containment vacuum ejector suction line inside containment shall be verified locked, sealed, or otherwise secured in the closed position each COLD SHUTDOWN, but not required to be verified more than once per 92 days.

G. Verify that each containment penetration not capable of being closed by OPERABLE automatic isolation valves and required to be closed during accident conditions is closed by manual valves, blind flanges, or deactivated automatic valves secured* in the closed position at the frequency specified in the Surveillance Frequency Control Program. Valves, blind flanges, and deactivated automatic or manual valves located inside containment which are locked, sealed, or otherwise secured in the closed position shall be verified closed during each COLD SHUTDOWN, but not required to be verified more than once per 92 days.

* Non-automatic or deactivated automatic valves may be opened on an intermittent basis under administrative control. The valves identified in TS 3.8.A.2 and TS 3.8.A.3 are excluded from this provision.

Other channels are subject only to the “drift” errors induced within the instrumentation itself and, consequently, can tolerate longer intervals between calibration. Process systems instrumentation errors resulting from drift within the individual instruments are normally negligible.

During the interval between periodic channel tests and check of each channel, a comparison between redundant channels will reveal any abnormal condition resulting from a calibration shift, due to instrument drift of a single channel.

During the periodic channel test, if it is deemed necessary, the channel may be tuned to compensate for the calibration shift. However, it is not expected that this will be required at any fixed or frequent interval.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Testing

The OPERABILITY of the Reactor Trip System and ESFAS instrumentation systems and interlocks ensures that 1) the associated ESF action and/or reactor trip will be initiated when the parameter monitored by each channel or combination thereof exceeds its setpoint, 2) the specified coincidence logic and sufficient redundancy are maintained to permit a channel to be out of service for testing or maintenance consistent with maintaining an appropriate level of reliability of the RTS and ESFAS instrumentation, and 3) sufficient system functional capability is available from diverse parameters.

The surveillance requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance test frequencies are controlled under the Surveillance Frequency Control Program.

Surveillance testing of instrument channels is routinely performed with the channel in the tripped condition. Only those instrument channels with hardware permanently installed that permits bypassing without lifting a lead or installing a jumper are routinely tested in the bypass condition. However, an inoperable channel may be bypassed by lifting a lead or installing a jumper to permit surveillance testing of another instrument channel of the same functional unit.

Some items in Table 4.1-1 have a test frequency of prior to each startup if not done within the previous 31 days with no applicability specified with respect to when during each startup. The following information is provided for those items to clarify when during each startup the testing is required to be performed:

- Table 4.1-1 Item 2 - Nuclear Intermediate Range - Prior to criticality if not done within the previous 31 days
- Table 4.1-1 Item 3 - Nuclear Source Range - Prior to criticality if not done within the previous 31 days
- Table 4.1-1 Item 28.A - Turbine Trip Stop Valve Closure - Prior to exceeding the P-7 setpoint if not done within the previous 31 days
- Table 4.1-1 Item 28.B - Turbine Trip Low Fluid Oil Pressure - Prior to exceeding the P-7 setpoint if not done within the previous 31 days

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The refueling water storage tank is sampled weekly for Cl^- and/or F^- contaminations. Weekly sampling is adequate to detect any inleakage of contaminated water.

Main Control Room/Emergency Switchgear Room (MCR/ESGR) Envelope Isolation Actuation Instrumentation

The MCR/ESGR Envelope Isolation Actuation function provides a protected environment from which operators can control the unit following an uncontrolled release of radioactivity. A functional check of the Manual Actuation function is performed at the frequency specified in the Surveillance Frequency Control Program. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Surveillance Requirement will ensure that the two trains of the MCR/ESGR envelope isolation dampers close upon manual actuation of the MCR/ESGR Envelope Isolation Actuation Instrumentation and that the supply and exhaust fans in the normal ventilation system for the MCR/ESGR envelope shut down, as well as adjacent area ventilation fans. Automatic actuation of the MCR/ESGR Envelope Isolation Actuation Instrumentation is confirmed as part of the Logic Channel Testing for the Safety Injection system.

Pressurizer PORV, PORV Block Valve, and PORV Backup Air Supply

The safety-related, seismic PORV backup air supply is relied upon for two functions - mitigation of a design basis steam generator tube rupture accident and low temperature overpressure protection (LTOP) of the reactor vessel during startup and shutdown. The surveillance criteria are based upon the more limiting requirements for the backup air supply (i.e. more PORV cycles potentially required to perform the mitigation function), which are associated with the LTOP function.

The PORV backup air supply system is provided with a calibrated alarm for low air pressure. The alarm is located in the control room. Failures such as regulator drift and air leaks which result in low pressure can be easily recognized by alarm or annunciator action. A periodic verification of air pressure against the surveillance limit supplements this type of built-in surveillance. Based on experience in operation, the minimum checking frequencies set forth are deemed adequate.

RCS Flow

This surveillance requirement in Table 4.1-2A is modified by a note that allows entry into POWER OPERATION, without having performed the surveillance, and placement of the unit in the best condition for performing the surveillance. The

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note states that the surveillance requirement is not required to be performed until 7 days after reaching a THERMAL POWER of $\geq 90\%$ of RATED POWER. The 7 day period after reaching 90% of RATED POWER is reasonable to establish stable operating conditions, install the test equipment, perform the test, and analyze the results. The surveillance shall be performed within 7 days after reaching 90% of RATED POWER. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

TABLE 4.1-1
MINIMUM FREQUENCIES FOR CHECK, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

<u>Channel Description</u>	<u>Check</u>	<u>Calibrate</u>	<u>Test</u>	<u>Remarks</u>
1. Nuclear Power Range	SFCP	SFCP (1,5) SFCP (3,5) SFCP(4)	SFCP (2)	1) Against a heat balance standard, above 15% RATED POWER 2) Signal at ΔT ; bistable action (permissive, rod stop, trip) 3) Upper and lower chambers for symmetric offset by means of the movable incore detector system 4) Neutron detectors may be excluded from CHANNEL CALIBRATION 5) The provisions of Specification 4.0.4 are not applicable
2. Nuclear Intermediate Range (below P-10 setpoint)	*SFCP	SFCP (2,3)	P(1)	1) Log level; bistable action (permissive, rod stop, trip) 2) Neutron detectors may be excluded from CHANNEL CALIBRATION 3) The provisions of Specification 4.0.4 are not applicable
3. Nuclear Source Range (below P-6 setpoint)	*SFCP	SFCP (2,3)	P(1)	1) Bistable action (alarm, trip) 2) Neutron detectors may be excluded from CHANNEL CALIBRATION 3) The provisions of Specification 4.0.4 are not applicable
4. Reactor Coolant Temperature	*SFCP	SFCP	SFCP (1) SFCP (2)	1) Overtemperature ΔT 2) Overpower ΔT
5. Reactor Coolant Flow	SFCP	SFCP	SFCP	
6. Pressurizer Water Level	SFCP	SFCP	SFCP	
7. Pressurizer Pressure (High & Low)	SFCP	SFCP	SFCP	
8. 4 KV Voltage and Frequency	N.A.	SFCP	SFCP (1)	1) Setpoint verification not required
9. Analog Rod Position	*SFCP (1,2) (3)	SFCP	N.A.	1) With step counters 2) Each six inches of rod motion when data logger is out of service 3) N.A. when reactor is in HOT, INTERMEDIATE OR COLD SHUTDOWN

Amendment Nos.

TABLE 4.1-1(Continued)
MINIMUM FREQUENCIES FOR CHECK, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

<u>Channel Description</u>	<u>Check</u>	<u>Calibrate</u>	<u>Test</u>	<u>Remarks</u>
10. Rod Position Bank Counters	SFCP (1,2) SFCP (3)	N.A.	N.A.	1) Each six inches of rod motion when data logger is out of service 2) With analog rod position 3) For the control banks, the benchboard indicators shall be checked against the output of the bank overlap unit.
11. Steam Generator Level	SFCP	SFCP	SFCP	
12. Deleted				
13. Deleted				
14. Deleted				
15. Recirculation Mode Transfer				
a. Refueling Water Storage Tank Level-Low-Low	SFCP	SFCP	SFCP	
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	SFCP	
16. Recirculation Spray Pump Start				
a. RWST Level-Low	SFCP	SFCP	SFCP	
17. Reactor Containment Pressure-CLS	*SFCP	SFCP	SFCP (1)	1) Isolation valve signal and spray signal
18. Deleted				
19. Deleted				
20. Deleted				
21. Deleted				
22. Steam Line Pressure	SFCP	SFCP	SFCP	

Amendment Nos.

TABLE 4.1-1(Continued)
MINIMUM FREQUENCIES FOR CHECK, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

<u>Channel Description</u>	<u>Check</u>	<u>Calibrate</u>	<u>Test</u>	<u>Remarks</u>
23. Turbine First Stage Pressure	SFCP	SFCP	SFCP	
24. Deleted				
25. Deleted				
26. Logic Channel Testing	N.A.	N.A.	SFCP (1)(2)	1) Reactor protection, safety injection and the consequence limiting safeguards system logic are tested per this line item. 2) The master and slave relays are not included in the periodic logic channel test of the safety injection system.
27. Deleted				
28. Turbine Trip				Setpoint verification is not applicable
a. Stop valve closure	N.A.	N.A.	P	
b. Low fluid oil pressure	N.A.	N.A.	P	
29. Deleted				
30. Reactor Trip Breaker	N.A.	N.A.	SFCP	The test shall independently verify operability of the undervoltage and shunt trip attachments
31. Deleted				

Amendment Nos.

TABLE 4.1-1(Continued)
MINIMUM FREQUENCIES FOR CHECK, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

<u>Channel Description</u>	<u>Check</u>	<u>Calibrate</u>	<u>Test</u>	<u>Remarks</u>
32. Auxiliary Feedwater				
a. Steam Generator Water Level Low-Low	SFCP	SFCP	SFCP (1)	1) The auto start of the turbine driven pump is not included in the periodic test, but is tested within 31 days prior to each startup.
b. RCP Undervoltage	SFCP	SFCP	SFCP (1)(2)	1) The actuation logic and relays are tested within 31 days prior to each startup. 2) Setpoint verification not required.
c. S.I.	(All Safety Injection surveillance requirements)			
d. Station Blackout	N.A.	SFCP	N.A.	
e. Main Feedwater Pump Trip	N.A.	N.A.	SFCP	
33. Loss of Power				
a. 4.16 KV Emergency Bus Undervoltage (Loss of Voltage)	N.A.	SFCP	SFCP (1)	1) Setpoint verification not required.
b. 4.16 KV Emergency Bus Undervoltage (Degraded Voltage)	N.A.	SFCP	SFCP (1)	1) Setpoint verification not required.
34. Deleted				
35. Manual Reactor Trip	N.A.	N.A.	SFCP	The test shall independently verify the operability of the undervoltage and shunt trip attachments for the manual reactor trip function. The test shall also verify the operability of the bypass breaker trip circuit.
36. Reactor Trip Bypass Breaker	N.A.	N.A.	SFCP (1), SFCP (2)	1) Remote manual undervoltage trip immediately after placing the bypass breaker into service, but prior to commencing reactor trip system testing or required maintenance. 2) Automatic undervoltage trip.
37. Safety Injection Input to RPS	N.A.	N.A.	SFCP	
38. Reactor Coolant Pump Breaker Position Trip	N.A.	N.A.	SFCP	

Amendment Nos.

TABLE 4.1-1(Continued)
MINIMUM FREQUENCIES FOR CHECK, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

<u>Channel Description</u>	<u>Check</u>	<u>Calibrate</u>	<u>Test</u>	<u>Remarks</u>
39. Steam/Feedwater Flow and Low S/G Water Level	SFCP	SFCP	SFCP (1)	1) The provisions of Specification 4.0.4 are not applicable
40. Intake Canal Low (See Note 1)	SFCP	SFCP	SFCP (1), SFCP (2)	1) Logic Test 2) Channel Electronics Test
41. Turbine Trip and Feedwater Isolation				
a. Steam generator water level high	SFCP	SFCP	SFCP	
b. Automatic actuation logic and actuation relay	N.A.	SFCP	SFCP (1)	1) Automatic actuation logic only, actuation relays tested each refueling
42. Reactor Trip System Interlocks				
a. Intermediate range neutron flux, P-6	N.A.	SFCP (1)	SFCP (2)	1) Neutron detectors may be excluded from the calibration
b. Low reactor trips block, P-7	N.A.	SFCP (1)	SFCP (2)	2) The provisions of Specification 4.0.4 are not applicable.
c. Power range neutron flux, P-8	N.A.	SFCP (1)	SFCP (2)	
d. Power range neutron flux, P-10	N.A.	SFCP (1)	SFCP (2)	
e. Turbine impulse pressure	N.A.	SFCP	SFCP	

Amendment Nos.

TABLE 4.1-1(Continued)
MINIMUM FREQUENCIES FOR CHECK, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

<u>Channel Description</u>	<u>Check</u>	<u>Calibrate</u>	<u>Test</u>	<u>Remarks</u>
43. Engineered Safeguards Actuation Interlocks				
a. Reactor trip, P-4	N.A.	N.A.	SFCP	
b. Pressurizer pressure, P-11	N.A.	SFCP	SFCP	
c. Low, low T _{avg} , P-12	N.A.	SFCP	SFCP	

P - Prior to each startup if not done within the frequency specified in the Surveillance Frequency Control Program

SFCP - Surveillance frequencies are specified in the Surveillance Frequency Control Program.

Note 1:

- Check Consists of verifying for an indicated intake canal level greater than 23'-5.85" that all four low level sensor channel alarms are not in an alarm state.
- Calibration Consists of uncovering the level sensor and measuring the time response and voltage signals for the immersed and dry conditions. It also verifies the proper action of instrument channel from sensor to electronics to channel output relays and annunciator. Only the two available sensors on the shutdown unit would be tested.
- Tests 1) The logic test verifies the three out of four logic development for each train by using the channel test switches for that train.
 2) Channel electronics test verifies that electronics module responds properly to a superimposed differential millivolt signal which is equivalent to the sensor detecting a "dry" condition.

TABLE 4.1-1A
EXPLOSIVE GAS MONITORING INSTRUMENTATION REQUIREMENTS

<u>CHANNEL DESCRIPTION</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>
1. Waste Gas Holdup System Explosive Gas Monitoring System			
Oxygen Monitor	SFCP	SFCP (1)	SFCP

SFCP - Surveillance frequencies are specified in the Surveillance Frequency Control Program.

- (1) The channel calibration shall include the use of standard gas samples containing a nominal:
1. one volume percent oxygen, balance nitrogen, and
 2. four volume percent oxygen, balance nitrogen

TABLE 4.1-2
ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK (1)</u>	<u>CHANNEL CALIBRATION</u>
1. Auxiliary Feedwater Flow	SFCP	SFCP
2. Inadequate Core Cooling	SFCP	SFCP
3. Containment Pressure (Wide Range)	SFCP	SFCP
4. Containment Pressure	SFCP	SFCP
5. Containment Sump Water Level (Wide Range)	SFCP	SFCP
6. Containment Area Radiation (High Range)	SFCP	SFCP
7. Power Range Neutron Flux	SFCP	SFCP (2)
8. Source Range Neutron Flux	SFCP	SFCP (2)
9. Reactor Coolant System (RCS) Hot Leg Temperature (Wide Range)	SFCP	SFCP
10. RCS Cold Leg Temperature (Wide Range)	SFCP	SFCP
11. RCS Pressure (Wide Range)	SFCP	SFCP
12. Penetration Flow Path Containment Isolation Valve Position	SFCP	SFCP (3)
13. Pressurizer Level	SFCP	SFCP
14. Steam Generator (SG) Water Level (Wide Range)	SFCP	SFCP
15. SG Water Level (Narrow Range)	SFCP	SFCP
16. SG Pressure	SFCP	SFCP
17. Emergency Condensate Storage Tank Level	SFCP	SFCP
18. High Head Safety Injection Flow to Cold Leg	SFCP	SFCP

SFCP - Surveillance frequencies are specified in the Surveillance Frequency Control Program.

- (1) Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.
- (2) Neutron detectors are excluded from CHANNEL CALIBRATION.
- (3) Rather than CHANNEL CALIBRATION, this surveillance shall be an operational test, consisting of verification of operability of all devices in the channel.

Amendment Nos.

TABLE 4.1-2A
MINIMUM FREQUENCY FOR EQUIPMENT TESTS

<u>DESCRIPTION</u>	<u>TEST</u>	<u>FREQUENCY</u>	<u>FSAR SECTION REFERENCE</u>
1. Control Rod Assemblies	Rod drop times of all full length rods at hot conditions	Prior to reactor criticality: a. For all rods following each removal of the reactor vessel head b. For specially affected individual rods following any maintenance on or modification to the control rod drive system which could affect the drop time of those specific rods c. SFCP	7
2. Control Rod Assemblies	Partial movement of all rods	SFCP	7
3. Refueling Water Chemical Addition Tank	Functional	SFCP	6
4. Pressurizer Safety Valves	Setpoint	Per the Inservice Testing Program	4
5. Main Steam Safety Valves	Setpoint	Per the Inservice Testing Program	10
6. Containment Isolation Trip	* Functional	SFCP	5
7. Refueling System Interlocks	* Functional	Prior to refueling	9.12
8. Service Water System	* Functional	SFCP	9.9
9. Deleted			
10. Deleted			
11. Diesel Fuel Supply	* Fuel Inventory	SFCP	8.5
12. Deleted			
13. Main Steam Line Trip Valves	Functional (Full Closure)	Before each startup (TS 4.7) The provisions of Specification 4.0.4. are not applicable	10

Amendment Nos.

TS 4.1-9b

TABLE 4.1-2A (CONTINUED)
MINIMUM FREQUENCY FOR EQUIPMENT TESTS

<u>DESCRIPTION</u>	<u>TEST</u>	<u>FREQUENCY</u>	<u>FSAR SECTION REFERENCE</u>
14a. Service Water System Valves in Line Supplying Recirculation Spray Heat Exchangers	Functional	SFCP	9.9
b. Service Water System Valves Isolating Flow to Non-essential loads on Intake Canal Low Level Isolation	Functional	SFCP	9.9
15. MCR/ESGR Envelope Isolation Actuation Instrumentation - Manual	Functional	SFCP	9.13
16. Reactor Vessel Overpressure Mitigating System (except backup air supply)	Functional & Setpoint	Prior to decreasing RCS temperature below 350°F and monthly while the RCS is < 350°F and the Reactor Vessel Head is bolted	4.3
	CHANNEL CALIBRATION	SFCP	
17. Reactor Vessel Overpressure Mitigating System Backup Air Supply	Setpoint	SFCP	4.3
18. Power-Operated Relief Valve Control System	Functional, excluding valve actuation	SFCP	4.3
	CHANNEL CALIBRATION	SFCP	

Amendment Nos.

TABLE 4.1-2A(CONTINUED)
MINIMUM FREQUENCY FOR EQUIPMENT TESTS

<u>DESCRIPTION</u>	<u>TEST</u>	<u>FREQUENCY</u>	<u>UFSAR SECTION REFERENCE</u>
19. Primary Coolant System	Functional	1. Periodic leakage testing(a)(b) on each valve listed in Specification 3.1.C.5.a shall be accomplished prior to entering POWER OPERATION after every time the plant is placed in COLD SHUTDOWN for refueling, after each time the plant is placed in COLD SHUTDOWN for 72 hours if testing has not been accomplished in the preceding 9 months, and prior to returning the valve to service after maintenance, repair or replacement work is performed.	
20. Containment Purge MOV Leakage	Functional	Semi-Annual (Unit at power or shutdown) if purge valves are operated during interval(c)	
21. Deleted			
22. RCS Flow	Flow \geq 273,000 gpm and \geq the limit as specified in the CORE OPERATING LIMITS REPORT	SFCP (d)	14
23. Deleted			
SFCP - Surveillance frequencies are specified in the Surveillance Frequency Control Program.			
(a) To satisfy ALARA requirements, leakage may be measured indirectly (as from the performance of pressure indicators) if accomplished in accordance with approved procedures and supported by computations showing that the method is capable of demonstrating valve compliance with the leakage criteria.			
(b) Minimum differential test pressure shall not be below 150 psid.			
(c) Refer to Section 4.4 for acceptance criteria.			
(d) Not required to be performed until 7 days after \geq 90% RATED POWER.			
* See Specification 4.1.D.			

Amendment Nos.

TABLE 4.1-2B
MINIMUM FREQUENCIES FOR SAMPLING TESTS

<u>DESCRIPTION</u>	<u>TEST</u>	<u>FREQUENCY</u>	<u>UFSAR SECTION REFERENCE</u>	
1. Reactor Coolant Liquid Samples	Radio-Chemical Analysis (1)	SFCP (5)		
	Gross Activity (2)	SFCP (5)	9.1	
	Tritium Activity	SFCP (5)	9.1	
	* Chemistry (CL, F & O ₂)	SFCP (9)	4	
	* Boron Concentration	SFCP	9.1	
	\bar{E} Determination	SFCP (3)		
	DOSE EQUIVALENT I-131	SFCP (5)		
	Radio-iodine Analysis (including I-131, I-133 & I-135)	Once/4 hours (6) and (7) below		
2. Refueling Water Storage	Chemistry (Cl & F)	SFCP	6	
3. Boric Acid Tanks	* Boron Concentration	SFCP	9.1	
4. Chemical Additive Tank	NaOH Concentration	SFCP	6	
5. Spent Fuel Pit	* Boron Concentration	SFCP	9.5	
6. Secondary Coolant	DOSE EQUIVALENT I-131	SFCP		
7. Stack Gas Iodine and Particulate Samples	* I-131 and particulate radioactive releases	SFCP		

* See Specification 4.1.D

SFCP - Surveillance frequencies are specified in the Surveillance Frequency Control Program. |

(1) A radiochemical analysis will be made to evaluate the following corrosion products: Cr-51, Fe-59, Mn-54, Co-58, and Co-60.

(2) A gross beta-gamma degassed activity analysis shall consist of the quantitative measurement of the total radioactivity of the primary coolant in units of $\mu\text{Ci/cc}$.

Amendment Nos.

2. By verifying that each motor-operated valve in the recirculation spray flow paths performs satisfactorily when tested in accordance with the Inservice Testing Program.
 3. By verifying each spray nozzle is unobstructed following maintenance which could cause nozzle blockage.
- C. In addition to the requirements of the Inservice Testing Program, each weight-loaded check valve in the containment spray and outside containment recirculation spray subsystems shall be demonstrated OPERABLE at the frequency specified in the Surveillance Frequency Control Program by cycling the valve one complete cycle of full travel and verifying that each valve opens when the discharge line of the pump is pressurized with air and seats when a vacuum is applied.
- D. Verify, by visual inspection at the frequency specified in the Surveillance Frequency Control Program, that the recirculation spray containment sump components are not restricted by debris and show no evidence of structural distress or abnormal corrosion.

Basis

The flow testing of each containment spray pump is performed by opening the normally closed valve in the containment spray pump recirculation line returning water to the refueling water storage tank. The containment spray pump is operated and a quantity of water recirculated to the refueling water storage tank. The discharge to the tank is divided into two fractions; one for the major portion of the recirculation flow and the other to pass a small quantity of water through test nozzles which are identical with those used in the containment spray headers.

The purpose of the recirculation through the test nozzles is to assure that there are no particulate material in the refueling water storage tank small enough to pass through pump suction strainers and large enough to clog spray nozzles.

Due to the physical arrangement of the recirculation spray pumps inside the containment, it is impractical to flow-test them other than during a unit outage. Flow testing of these pumps requires the physical modification of the pump discharge piping and the erection of a temporary dike to contain recirculated water. The length of time required to setup for the test, perform the test, and then reconfigure the system for normal operation is prohibitive to performing the flow-test on even the cold shutdown frequency. Therefore, the flow-test of the inside containment recirculation spray pumps will be performed in accordance with the Inservice Testing Program during a unit outage.

The inside containment recirculation spray pumps are capable of being operated dry for approximately 60 seconds without significantly overheating and/or degrading the pump bearings. During this dry pump check, it can be determined that the pump shafts are turning by rotation sensors which indicate in the Main Control Room. In addition, motor current will be compared with an established reference value to ascertain that no degradation of pump operation has occurred.

The recirculation spray pumps outside the containment have the capability of being dry-run and flow tested. The test of an outside recirculation spray pump is performed by closing the containment sump suction line valve and the isolation valve between the pump discharge and the containment penetration. This allows the pump casing to be filled with water and the pump to recirculate water through a test line from the pump discharge to the pump casing.

With a system flush conducted to remove particulate matter prior to the installation of spray nozzles and with corrosion resistant nozzles and piping, it is not considered credible that a significant number of nozzles would plug during the life of the unit to reduce the effectiveness of the subsystems. Therefore, an inspection or air or smoke test of the nozzles following maintenance which could cause nozzle blockage is sufficient to indicate that plugging of the nozzles has not occurred.

The spray nozzles in the refueling water storage tank provide means to ensure that there is no particulate matter in the refueling water storage tank and the containment spray subsystems which could plug or cause deterioration of the spray nozzles. The nozzles in the tank are identical to those used on the containment spray headers. The flow test of the containment spray pumps and recirculation to the refueling water storage will indicate any plugging of the nozzles by a reduction of flow through the nozzles.

Periodic inspections of containment sump components ensure that the components are unrestricted and stay in proper operating condition. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

References

FSAR Section 6.3.1, Containment Spray Pumps

FSAR Section 6.3.1, Recirculation Spray Pumps

4.6 EMERGENCY POWER SYSTEM PERIODIC TESTING

Applicability

Applies to periodic testing and surveillance requirements of the Emergency Power System.

Objective

To verify that the Emergency Power System will respond promptly and properly when required.

Specification

The following tests and surveillance shall be performed as stated:

A. Diesel Generators

1. Tests and Frequencies

- a. Manually initiated start of the diesel generator, followed by manual synchronization with other power sources and assumption of load by the diesel generator up to 2750 Kw. This test will be conducted at the frequency specified in the Surveillance Frequency Control Program on each diesel generator for a duration of 30 minutes. Normal station operation will not be affected by this test.

- b. Automatic start of each diesel generator, load shedding, and restoration to operation of particular vital equipment, initiated by a simulated loss of off-site power together with a simulated safety injection signal. Testing will demonstrate load shedding and load sequencing initiated by a simulated loss of off-site power following a simulated engineered safety features signal. Testing will also demonstrate that the loss of voltage and degraded voltage protection is defeated whenever the emergency diesel is the sole source of power to an emergency bus and that this protection is automatically reinstated when the diesel output breaker is opened. This test will be conducted at the frequency specified in the Surveillance Frequency Control Program to assure that the diesel generator will start and accept load in less than or equal to 10 seconds after the engine starting signal.
- c. Availability of the fuel oil transfer system shall be verified by operating the system in conjunction with TS 4.6.A.1.a surveillance.
- d. Each diesel generator shall be given a thorough inspection at the frequency specified in the Surveillance Frequency Control Program utilizing the manufacturer's recommendations for this class of stand-by service.

2. Acceptance Criteria

The above tests will be considered satisfactory if all applicable equipment operates as designed.

B. Fuel Oil Storage Tanks for Diesel Generators

1. A minimum fuel oil storage of 35,000 gal shall be maintained on-site to assure full power operation of one diesel generator for seven days.

C. Station Batteries

1. Tests and Frequencies

The following Tests shall be performed at the frequencies specified in the Surveillance Frequency Control Program:

- a. Measure the specific gravity, electrolytic temperature, cell voltage of the pilot cell in each battery, and the D.C. bus voltage of each battery.
- b. Measure the voltage of each battery cell in each battery to the nearest 0.01 volts.
- c. Measure the specific gravity of each battery cell, the temperature reading of every fifth cell, the height of electrolyte of each cell, and the amount of water added to any cell.
- d. Compare the battery voltage and current after the battery charger has been turned off for approximately 5 min during normal operation.
- e. Perform a simulated load test without battery charger on each station battery. The battery voltage and current as a function of time shall be monitored.
- f. Check the battery connections for tightness and apply anti-corrosion coating to the interconnections.

2. Acceptance Criteria

- a. Each test shall be considered satisfactory if the new data when compared to the old data indicate no signs of abuse or deterioration.

- b. The load test in (d) and (e) above shall be considered satisfactory if the batteries perform within acceptable limits as established by the manufacturers discharge characteristic curves.

D. EMERGENCY DIESEL GENERATOR BATTERIES

1. TESTS AND FREQUENCIES

The following Tests shall be performed at the frequencies specified in the Surveillance Frequency Control Program:

- a. Measure the specific gravity, electrolytic temperature, cell voltage of the pilot cell in each battery and the D.C. bus voltage of each battery.
- b. Measure the voltage of each battery cell in each battery to the nearest 0.01 volts.
- c. Measure the specific gravity of each battery cell, the temperature reading of every fifth cell, the height of electrolyte of each cell, and the amount of water added to any cell.
- d. Perform a normal load or simulated load test without battery charger on each battery. The battery voltage and current as a function of time shall be monitored.
- e. Check the battery connections for tightness and apply anti-corrosion coating to interconnections.

2. ACCEPTANCE CRITERIA

- a. Each test shall be considered satisfactory if the new data when compared to the old data indicate no signs of abuse or deterioration.
- b. The load test in (d) above shall be considered satisfactory if the batteries perform within acceptable limits as established by the manufacturers discharge characteristic curves.

Basis

The tests specified are designed to demonstrate that the diesel generators will provide power for operation of essential safeguards equipment. They also assure that the emergency diesel generator system controls and the control systems for the safeguards equipment will function automatically in the event of a loss of normal station service power.

The testing frequency specified in the Surveillance Frequency Control Program will be often enough to identify and correct any mechanical or electrical deficiency before it can result in a system failure. The fuel supply and starting circuits and controls are continuously monitored and any faults are alarm indicated. An abnormal condition in these systems would be signaled without having to place the diesel generators themselves on test.

Station and emergency diesel generator batteries may deteriorate with time, but precipitous failure is extremely unlikely. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. In addition alarms have been provided to indicate low battery voltage and low current from the inverters which would make it extremely unlikely that deterioration would go unnoticed.

The equalizing charge, as recommended by the manufacturer, is vital to maintaining the ampere-hour capability of the battery. As a check upon the effectiveness of the equalizing charge, the battery shall be loaded rather heavily and the voltage monitored as a function of time. If a cell has deteriorated or if a connection is loose, the voltage under load will drop excessively indicating the need for replacement or maintenance. FSAR Section 8.5 provides further amplification of the basis.

References

FSAR Section 8.5 Emergency Power System

Amendment Nos.

4.8 AUXILIARY FEEDWATER SYSTEM

Applicability

Applies to the periodic testing requirements of the Auxiliary Feedwater System.

Objective

To verify the operability of the auxiliary feedwater pumps.

Specification

A. Tests and Frequencies

The following Tests shall be performed at the frequencies specified in the Surveillance Frequency Control Program unless otherwise noted below:

1. Verify that the Auxiliary Feedwater System manual, power operated, and automatic valves in each flowpath are in the correct position. This verification includes valves that are not locked, sealed, or otherwise secured in position, valves in the cross-connect from the opposite unit and valves in the steam supply paths to the turbine driven auxiliary feedwater pump.
2. Verify that each motor-operated valve in the auxiliary feedwater flowpaths, including the cross-connect from the opposite unit, performs satisfactorily when tested in accordance with the Inservice Testing Program.
3. Verify that the auxiliary feedwater pumps perform satisfactorily when tested in accordance with the Inservice Testing Program. The provisions of Specification 4.0.4 are not applicable for the turbine driven pump. Note that the developed head test of the turbine driven pump is required to be performed within 24 hours after reaching HOT SHUTDOWN.

Amendment Nos.

4. Whenever the unit's Reactor Coolant System temperature and pressure have been less than 350°F and 450 psig, respectively, for a period greater than 30 days, prior to Reactor Coolant System temperature and pressure exceeding 350°F and 450 psig, respectively, verify proper alignment of the required auxiliary feedwater flowpaths by verifying flow from the 110,000 gallon above ground Emergency Condensate Storage Tank to the steam generators from each of the auxiliary feedwater pumps.
5. During periods of reactor shutdown with the opposite unit's Reactor Coolant System temperature and pressure greater than 350°F and 450 psig, respectively:
 - a. Continue to verify that the motor driven auxiliary feedwater pumps perform satisfactorily when tested at the frequency defined in Specification 4.8.A.3.
 - b. Verify that each motor-operated valve in the auxiliary feedwater cross-connect flowpath for the opposite unit performs satisfactorily when tested in accordance with the Inservice Testing Program.
6. Verify automatic actuation of:
 - a. Each auxiliary feedwater automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.
 - b. Each auxiliary feedwater pump starts automatically on an actual or simulated actuation signal. Note that this surveillance is required to be performed for the turbine driven pump within 24 hours after reaching HOT SHUTDOWN.

Basis

The correct alignment for manual, power operated, and automatic valves in the Auxiliary Feedwater System steam and water flowpaths, including the cross-connect flowpath, will provide assurance that the proper flowpaths exist for system operation. This position check does not include: 1) valves that are locked, sealed or otherwise secured in position since they are verified to be in their correct position prior to locking, sealing or otherwise securing; 2) vent, drain or relief valves on those flowpaths; and, 3) those valves that cannot be inadvertently misaligned such as check valves. This surveillance does not require any testing or valve manipulation. It involves verification that those valves capable of being mispositioned are in the correct position. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Valves in the auxiliary feedwater flowpaths to the steam generators and cross-connect flow path are tested periodically in accordance with the Inservice Testing Program. The auxiliary feedwater pumps are tested periodically in accordance with the Inservice Testing Program to demonstrate operability. Verification of the developed head of each auxiliary feedwater pump ensures that the pump performance has not degraded. Flow and differential head tests are normal inservice testing requirements. Because it is sometimes undesirable to introduce cold auxiliary feedwater into the steam generators while they are operating, the inservice testing is typically performed on recirculation flow to the 110,000 gallon Emergency Condensate Storage Tank.

Appropriate surveillance and post-maintenance testing is required to declare equipment OPERABLE. Testing may not be possible in the applicable plant conditions due to the necessary unit parameters not having been established. In this situation, the equipment may be considered OPERABLE provided testing has been satisfactorily completed to the extent possible, and the equipment is not otherwise believed to be incapable of performing its function. This will allow operation to proceed to a condition where other necessary surveillance or post maintenance tests can be completed. Relative to the turbine driven auxiliary feedwater pump, Specification 4.8.A.3.a is modified by a note indicating that the developed head test of the turbine driven pump should be deferred until suitable conditions are established; this deferral is required because there may be insufficient steam pressure to perform the test.

Amendment Nos.

The auxiliary feedwater pumps are capable of supplying feedwater to the opposite unit's steam generators. For a main steam line break or fire event in the Main Steam Valve House, one of the opposite units auxiliary feedwater pumps is required to supply feedwater to mitigate the consequences of those accidents. Therefore, when considering a single failure, both motor driven auxiliary feedwater pumps are required to be OPERABLE* during shutdown to support the opposite unit if the Reactor Coolant System temperature or pressure of the opposite unit is greater than 350°F and 450 psig, respectively. Thus, to establish operability* the motor driven auxiliary feedwater pumps will continue to be tested in accordance with the Inservice Testing Program when the unit is shutdown to support the opposite unit.

The capacity of the Emergency Condensate Storage Tank and the flow rate of any one of the three auxiliary feedwater pumps in conjunction with the water inventory of the steam generators is capable of maintaining the plant in a safe condition and sufficient to cool the unit down.

Proper functioning of the steam turbine admission valve and the ability of the auxiliary feedwater pumps to start will demonstrate the integrity of the system. Verification of correct operation can be made both from instrumentation within the Main Control Room and direct visual observation of the pumps.

* excluding automatic initiation instrumentation

References

UFSAR Section 10.3.1, Main Steam System

UFSAR Section 10.3.2, Auxiliary Steam System

UFSAR Section 10.3.5, Condensate and Feedwater Systems

4.9 RADIOACTIVE GAS STORAGE MONITORING SYSTEM

Applicability

Applies to the periodic monitoring of radioactive gas storage.

Objective

To ascertain that waste gas is stored in accordance with Specification 3.11.

Specification

- A. The concentration of oxygen in the waste gas holdup system shall be determined to be within the limits of Specification 3.11.A by continuously monitoring the waste gases in the waste gas holdup system with the oxygen monitor required to be OPERABLE by Table 3.7-5(a) of Specification 3.7.E.
- B. The quantity of radioactive material contained in each gas storage tank shall be determined to be within the limits of Specification 3.11.B at the frequency specified in the Surveillance Frequency Control Program when the specific activity of the primary reactor coolant is $\leq 2200 \mu\text{Ci/gm}$ dose equivalent Xe-133. Under the conditions which result in a specific activity $> 2200 \mu\text{Ci/gm}$ dose equivalent Xe-133, the waste gas decay tanks shall be sampled once per day.

4.10 REACTIVITY ANOMALIES

Applicability

Applies to potential reactivity anomalies.

Objective

To require evaluation of applicable reactivity anomalies within the reactor.

Specification

- A. Following a normalization of the computed boron concentration as a function of burnup, the actual boron concentration of the coolant shall be compared with the predicted value at the frequency specified in the Surveillance Frequency Control Program. If the difference between the observed and predicted steady-state concentrations reaches the equivalent of one percent in reactivity, an evaluation as to the cause of the discrepancy shall be made. The provisions of Specification 4.0.4 are not applicable.
- B. During periods of POWER OPERATION at greater than 10% of RATED POWER, the hot channel factors identified in Section 3.12 shall be determined during each effective full power month of operation using data from limited core maps. If these factors exceed their limits, an evaluation as to the cause of the anomaly shall be made. The provisions of Specification 4.0.4 are not applicable.

DELETED

Basis

BORON CONCENTRATION

To eliminate possible errors in the calculations of the initial reactivity of the core and the reactivity depletion rate, the predicted relation between fuel burnup and the boron concentration necessary to maintain adequate control characteristics must be adjusted (normalized) to accurately reflect actual core conditions. When full power is reached initially, and with the control rod assembly groups in the desired positions, the boron concentration is measured and the predicted curve is adjusted to this point. As power operation proceeds, the measured boron concentration is compared with the predicted concentration, and the slope of the curve relating burnup and reactivity is compared with that predicted. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. This process of normalization should be completed after about 10% of the total core burnup. Thereafter, actual boron concentration can be compared with prediction, and the reactivity status of the core can be continuously evaluated. Any reactivity anomaly greater than 1% would be unexpected, and its occurrence would be thoroughly investigated and evaluated.

The value of 1% is considered a safe limit since a shutdown margin of at least 1% with the most reactive control rod assembly in the fully withdrawn position is always maintained.

PEAKING FACTORS

A thermal criterion in the reactor core design specified that “no fuel melting during any anticipated normal operating condition” should occur. To meet the above criterion during a thermal overpower of 118% with additional margin for design uncertainties, a steady state maximum linear power is selected. This then is an upper linear power limit determined by the maximum central temperature of the hot pellet.

The peaking factor is a ratio taken between the maximum allowed linear power density in the reactor to the average value over the whole reactor. It is of course the average value that determines the operating power level. The peaking factor is a constraint which must be met to assure that the peak linear power density does not exceed the maximum allowed value.

During normal reactor operation, measured peaking factors should be significantly lower than design limits. As core burnup progresses, measured designed peaking factors typically decrease. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. |

4.11 SAFETY INJECTION SYSTEM TESTS

Applicability

Applies to the operational testing of the Safety Injection System.

Objective

To verify that the Safety Injection System will respond promptly and perform its design functions, if required.

Specifications

- A. The refueling water storage tank (RWST) shall be demonstrated OPERABLE at the frequency specified in the Surveillance Frequency Control Program by:
 - 1. Verifying the RWST solution temperature is within specified limits.
 - 2. Verifying:
 - a. The RWST contained borated water volume, and
 - b. The RWST boron concentration are within specified limits.
- B. Each safety injection accumulator shall be demonstrated OPERABLE at the frequency specified in the Surveillance Frequency Control Program or as specified below by:
 - 1. Verifying:
 - a. The contained borated water volume, and
 - b. The nitrogen cover-pressure are within specified limits.

2. Verifying:
 - a. The boron concentration of the accumulator solution is within specified limits, and
 - b. The boron concentration of the accumulator solution within 6 hours after each solution volume increase of greater than or equal to 1% of tank volume.

Note: Surveillance 4.11.B.2.b is not required when the volume increase makeup source is the RWST.

C. Each Safety Injection Subsystem shall be demonstrated OPERABLE at the frequency specified in the Surveillance Frequency Control Program unless otherwise noted below by:

1. Verifying, that on recirculation flow, each low head safety injection pump performs satisfactorily when tested in accordance with the Inservice Testing Program.
2. Verifying that each charging pump performs satisfactorily when tested in accordance with the Inservice Testing Program.
3. Verifying that each motor-operated valve in the safety injection flow path performs satisfactorily when tested in accordance with the Inservice Testing Program.
4. Prior to POWER OPERATION by:
 - a. Verifying that the following motor operated valves are blocked open by de-energizing AC power to the valves motor operator and tagging the breaker in the off position:

<u>Unit 1</u>	<u>Unit 2</u>
MOV-1890C	MOV-2890C

- b. Verifying that the following motor operated valves are blocked closed by de-energizing AC power to the valves motor operator and the breaker is locked, sealed or otherwise secured in the off position:

<u>Unit 1</u>	<u>Unit 2</u>
MOV-1869A	MOV-2869A
MOV-1869B	MOV-2869B
MOV-1890A	MOV-2890A
MOV-1890B	MOV-2890B

Amendment Nos.

- c. Power may be restored to any valve or breaker referenced in Specifications 4.11.C.4.a and 4.11.C.4.b for the purpose of testing or maintenance provided that not more than one valve has power restored at one time, and the testing and maintenance is completed and power removed within 24 hours.
5. Verifying:
- a. That each automatic valve capable of receiving a safety injection signal, actuates to its correct position upon receipt of a safety injection test signal. The charging and low head safety injection pumps may be immobilized for this test.
 - b. That each charging pump and safety injection pump circuit breaker actuates to its correct position upon receipt of a safety injection test signal. The charging and low head safety injection pumps may be immobilized for this test.
 - c. By visual inspection that the low head safety injection containment sump components are not restricted by debris and show no evidence of structural distress or abnormal corrosion.

Basis

Complete system tests cannot be performed when the reactor is operating because a safety injection signal causes containment isolation. The method of assuring operability of these systems is therefore to combine system tests to be performed during unit outages, with more frequent component tests, which can be performed during reactor operation.

The system tests demonstrate proper automatic operation of the Safety Injection System. A test signal is applied to initiate automatic operation action and verification is made that the components receive the safety injection signal in the proper sequence. The test may be performed with the pumps blocked from starting. The test demonstrates the operation of the valves, pump circuit breakers, and automatic circuitry.

During reactor operation, the instrumentation which is depended on to initiate safety injection is checked periodically, and the initiating circuits are tested in accordance with Specification 4.1. In addition, the active components (pumps and valves) are to be periodically tested to check the operation of the starting circuits and to verify that the pumps are in satisfactory running order. The test interval is determined in accordance with the Inservice Testing Program. The accumulators are a passive safeguard.

Periodic inspections of containment sump components ensure that the components are unrestricted and stay in proper operating condition. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

References

UFSAR Section 6.2, Safety Injection System

4.12 AUXILIARY VENTILATION EXHAUST FILTER TRAINS

Applicability

Applies to the testing of safety-related air filtration systems.

Objective

To verify that leakage efficiency and iodine removal efficiency are within acceptable limits.

Specifications

A. Tests and Frequency

The following Tests shall be performed at the frequencies specified in the Surveillance Frequency Control Program or as specified below and as required for the conditions identified below:

1. Operate each redundant filter train circuit.
2. Demonstrate the operability of the entire safety-related portion of the auxiliary ventilation system.
3. Determine auxiliary ventilation system exhaust fan flow rate through each filter train in the LOCA mode of operation initially, after any structural maintenance on the HEPA filter or charcoal adsorber housings, once per 18 months, or after partial or complete replacement of the HEPA filters of charcoal adsorbers.

The procedure for determining the air flow rate shall be in accordance with Section 9 of the ACGIH Industrial Ventilation document and Section 8 of ANSI N510-1975.

4. Conduct a visual inspection of the filter train and associated components before each in-place air flow distribution test, DOP test, or activated charcoal adsorber leak test in accordance with the intent of Section 5 of ANSI N510-1975.

Amendment Nos.

5. Perform an air distribution test across the prefilter bank initially and after any major modification, major repair, or maintenance of the air cleaning system affecting the filter bank flow distribution. The air distribution test shall be performed with an anemometer located at the downstream side and at the center of each carbon filter.
6. Perform in-place cold DOP tests for HEPA filter banks:
 - a. Initially;
 - b. Once per 18 months;
 - c. Following painting, fire, or chemical release in any ventilation zone communicating with the system during system operation;
 - d. After each complete or partial replacement of the HEPA filter cells; and
 - e. After any structural maintenance on the filter housing.

The procedure for in-place cold DOP tests shall be in accordance with ANSI N510-1975, Section 10.5 or 11.4. The flow rate during the in-place cold DOP tests shall be 36,000 CFM \pm 10 percent. The flow rate shall be determined by recording the flow meter reading in the control room.

7. Perform in-place halogenated hydrocarbon leakage tests for the charcoal adsorber bank:
 - a. Initially;
 - b. Once per 18 months;

- c. Following painting, fire, or chemical release in any ventilation zone communicating with the system during system operation;
- d. After each complete or partial replacement of charcoal adsorber trays; and
- e. After any structural maintenance of the filter housing.

The procedure for in-place halogenated hydrocarbon leakage tests shall be in accordance with ANSI N510-1975, Section 12.5. The flow rate during the in-place halogenated hydrocarbon leakage tests shall be 36,000 CFM \pm 10 percent. The flow rate shall be determined by recording the flow meter reading in the control room.

- 8. Perform laboratory analysis of each charcoal train:
 - a. Initially, whenever a new batch of charcoal is used to fill adsorbers trays; and
 - b. After 720 hours of train operation; and
 - c. Following painting, fire, or chemical release in any ventilation zone communicating with the system during system operation; and
 - d. After any structural maintenance on the HEPA filter or charcoal adsorber housings that could affect operation of the charcoal adsorber; and
 - e. At least once per eighteen months, if not otherwise performed per condition 8.b, 8.c, or 8.d within the last eighteen months.

The procedure for iodine removal efficiency tests shall follow ASTM D3803. The test conditions shall be in accordance with those listed in Specification 4.12.B.7.

9. Check the pressure drop across the HEPA filter and adsorber banks: |
 - a. Initially;
 - b. Once per 18 months thereafter for systems maintained in a standby status and after 720 hours of system operation; and
 - c. After each complete or partial replacement of filters or adsorbers.

B. Acceptance Criteria

1. The minimum period of air flow through the filters shall be 15 minutes. |
2. The system operability test of Specification 4.12.A.2 shall demonstrate automatic start-up, shutdown and flow path alignment.
3. The air flow rate determined in Specification 4.12.A.3 shall be:
 - a. 36,000 cfm \pm 10 percent with system in the LOCA mode of operation.
 - b. The ventilation system shall be adjusted until the above limit is met.
4. Air distribution test across the prefilter-bank shall show uniformity of air velocity within \pm 20 percent of average velocity. The ventilation system shall be adjusted until the limit is met.

A pressure drop across the combined HEPA filters and charcoal adsorbers of less than 7 inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Operation of the filtration system for a minimum of 15 minutes at the frequency specified in the Surveillance Frequency Control Program prevents moisture buildup in the filters and adsorbers. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

The frequency of tests and sample analysis of the degradable components of the system, i.e., the HEPA filter and charcoal adsorbers, is based on actual hours of operation to ensure that they perform as evaluated. System flow rates and air distribution do not change unless the ventilation system is radically altered.

If painting, fire, or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemical, or foreign material, the same tests and sample analysis are performed as required for operational use.

The in-place test results should indicate a system leak tightness of less than 1 percent bypass leakage for the charcoal adsorbers and a HEPA efficiency of at least 99.5 percent removal of DOP particulates. The heat release from operating ECCS equipment limits the relative humidity of the exhaust air to less than 80 percent even when outdoor air is assumed to be 100 percent relative humidity and all ECCS leakage evaporates into the exhaust air stream. Methyl iodide testing to a penetration less than or equal to 14 percent (applying a safety factor of 2) demonstrates the assumed accident analysis efficiencies of 70 percent for methyl iodide and 90 percent for elemental iodine. This conclusion is supported by a July 10, 2000 letter from NCS Corporation that stated "Nuclear grade activated carbon, when tested in accordance with ASTM D3803-1989 (methyl iodide...) to a penetration of 15%, is more conservative than testing the same carbon in accordance with ASTM D3803-1979 (elemental iodine...) to a penetration of 5%. ...As a general rule, you may expect the radioiodine penetration through nuclear grade activated carbon to increase from 20 to 100 times when switching from elemental iodine to methyl iodide testing." Therefore, the efficiencies of the HEPA filters and charcoal adsorbers are demonstrated to be as specified, at flow rates, temperatures, velocities, and relative humidities which are less than the design values of the system, the resulting doses will be less than or equal to the limits specified in 10 CFR 50.67 or Regulatory Guide 1.183 for the accidents analyzed. The demonstration of bypass 1% and demonstration of 86 percent methyl iodide removal efficiency will assure the required capability of the adsorbers is met or exceeded.

Amendment Nos.

4.13 RCS OPERATIONAL LEAKAGE

Applicability

The following specifications are applicable to RCS operational LEAKAGE whenever T_{avg} (average RCS temperature) exceeds 200°F (200 degrees Fahrenheit).

Objective

To verify that RCS operational LEAKAGE is maintained within the allowable limits, the following surveillances shall be performed at the frequencies specified in the Surveillance Frequency Control Program.

Specifications

- A. Verify RCS operational LEAKAGE is within the limits specified in TS 3.1.C by performance of RCS water inventory balance.^{1, 2}
- B. Verify primary to secondary LEAKAGE is ≤ 150 gallons per day through any one SG. If it is not practical to assign the LEAKAGE to an individual SG, all the primary to secondary LEAKAGE should be conservatively assumed to be from one SG.

Notes:

1. Not required to be completed until 12 hours after establishment of steady state operation.
2. Not applicable to primary to secondary LEAKAGE.

BASES

SURVEILLANCE REQUIREMENTS (SR)

SR 4.13.A

Verifying RCS LEAKAGE to be within the Limiting Condition for Operation (LCO) limits ensures the integrity of the reactor coolant pressure boundary (RCPB) is maintained. Pressure boundary LEAKAGE would at first appear as unidentified LEAKAGE and can only be positively identified by inspection. It should be noted that LEAKAGE past seals and gaskets is not pressure boundary LEAKAGE. Unidentified LEAKAGE and identified LEAKAGE are determined by performance of an RCS water inventory balance.

The RCS water inventory balance must be performed with the reactor at steady state operating conditions (stable pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The surveillance is modified by two notes. Note 1 states that this SR is not required to be completed until 12 hours after establishing steady state operation. The 12 hour allowance provides sufficient time to collect and process all necessary data after stable unit conditions are established.

Amendment Nos.

Steady state operation is required to perform a proper inventory balance since calculations during maneuvering are not useful. For RCS operational LEAKAGE determination by water inventory balance, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows.

An early warning of pressure boundary LEAKAGE or unidentified LEAKAGE is provided by the automatic systems that monitor the containment atmosphere radioactivity and the containment sump level. It should be noted that LEAKAGE past seals and gaskets is not pressure boundary LEAKAGE. These leakage detection systems are specified in the TS 3.1.C Bases.

Note 2 states that this SR is not applicable to primary to secondary LEAKAGE because LEAKAGE of 150 gallons per day cannot be measured accurately by an RCS water inventory balance.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 4.13.B

This SR verifies that primary to secondary LEAKAGE is less than or equal to 150 gallons per day through any one SG. Satisfying the primary to secondary LEAKAGE limit ensures that the operational LEAKAGE performance criterion in the Steam Generator Program is met. If this SR is not met, compliance with LCO 3.1.H, "Steam Generator Tube Integrity," should be evaluated. The 150 gallons per day limit is measured at room temperature as described in Reference 4. The operational LEAKAGE rate limit applies to LEAKAGE through any one SG.

If it is not practical to assign the LEAKAGE to an individual SG, all the primary to secondary LEAKAGE should be conservatively assumed to be from one SG. The surveillance is modified by a Note, which states that the Surveillance is not required to be performed until 12 hours after establishment of steady state operation. For RCS primary to secondary LEAKAGE determination, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows.

The primary to secondary LEAKAGE is determined using continuous process radiation monitors or radiochemical grab sampling in accordance with the EPRI guidelines (Ref. 4). The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 4.13.A and SR 4.13.B / Note 1

With respect to SR 4.13.A and SR 4.13.B, as the associated Note 1 modifies the required completion of the surveillance, it is construed to be part of the specified completion time. Should the surveillance interval be exceeded while steady state operation has not been established, Note 1 allows 12 hours after establishment of steady state operation to complete the surveillance. The surveillance is still considered to be completed within the specified completion time. Therefore, if the surveillance were not completed within the required surveillance interval (plus extension allowed by TS 4.0.2) interval, but steady state operation had not been established, it would not constitute a failure of the SR. Once steady state operation is established, 12 hours would be allowed for completing the surveillance. If the surveillance were not completed within this 12 hour interval, there would be a failure to complete a surveillance within the specified completion time, and the provisions of SR 4.0.3 would apply.

REFERENCES

1. UFSAR, Chapter 4, Surry Units 1 and 2.
2. UFSAR, Chapter 14, Surry Units 1 and 2.
3. NEI 97-06, "Steam Generator Program Guidelines."
4. EPRI, "Pressurized Water Reactor Primary-to-Secondary Leak Guidelines."

4.16 LEAKAGE TESTING OF MISCELLANEOUS RADIOACTIVE MATERIALS SOURCES

Applicability

Applies to miscellaneous radioactive materials sealed sources not subject to core flux and that are not stored and out of use.

Objective

To maintain doses due to ingestion or inhalation within the limits of 10 CFR 20.

Specifications

A. Source Leakage Test

Radioactive sources shall be leak tested for contamination. The leakage test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, it shall immediately be withdrawn from use, decontaminated, and repaired or be disposed of in accordance with Commission regulations.

Those quantities of byproduct material that exceed that quantities listed in 10 CFR 30.71 Schedule B are to be leak tested in accordance with the schedule shown in Surveillance Requirements. All other sources (including alpha emitters) containing greater than 0.1 microcurie are also to be leak tested in accordance with the Surveillance Requirements.

B. Surveillance Requirements

1. Test for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the

Commission or an agreement State as follows:

- a. Each sealed source, except startup sources subject to core flux, containing radioactive material other than Hydrogen 3 with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at the frequency specified in the Surveillance Frequency Control Program.
 - b. The periodic leak test required does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another user unless they have been leak tested at the frequency specified in the Surveillance Frequency Control Program prior to the date of use or transfer. In the absence of a certificate from a transferor indicating that a test has been made within the frequency specified in the Surveillance Frequency Control Program prior to the transfer, sealed sources shall not be put into use until tested.
 - c. Startup sources shall be leak tested prior to and following any repair or maintenance and before being subjected to core flux.
2. A complete inventory of radioactive materials in possession shall be maintained current at all times.

Basis

Ingestion or inhalation of source material may give rise to total body or organ irradiation. This specification assures that leakage from radioactive materials sources does not exceed allowable limits. The limits for all other sources (including alpha emitters) are based upon 10 CFR 70.39(c) limits for plutonium.

4.18 MAIN CONTROL ROOM/EMERGENCY SWITCHGEAR ROOM (MCR/ESGR)
EMERGENCY VENTILATION SYSTEM (EVS) TESTING

- A. Operate each MCR/ESGR EVS train for ≥ 15 minutes in accordance with the frequency specified in the Surveillance Frequency Control Program.
- B. Perform required Control Room Air Filtration System Testing in accordance with TS 4.20.
- C. Perform required MCR/ESGR envelope unfiltered air inleakage testing in accordance with the MCR/ESGR Envelope Habitability Program.

BASES

SURVEILLANCE REQUIREMENTS (SR)

SR 4.18.A

Standby systems should be checked periodically to ensure that they function properly. Systems without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. Operation of the MCR/ESGR EVS trains shall be initiated manually from the MCR.

SR 4.18.B

This SR verifies that the required Control Room Air Filtration System testing is performed in accordance with Specification 4.20. Specification 4.20 includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and the physical properties of the activated charcoal. Specific test frequencies and additional information are discussed in detail in TS 4.20.

SR 4.18.C

This SR verifies the OPERABILITY of the MCR/ESGR envelope boundary by testing for unfiltered air inleakage past the MCR/ESGR envelope boundary and into the MCR/ESGR envelope. The details of the testing are specified in the MCR/ESGR Envelope Habitability Program (TS 6.4.R).

4. Measurement, at designated locations, of the MCR/ESGR envelope pressure relative to all external areas adjacent to the MCR/ESGR envelope boundary during the pressurization mode of operation by one train of the MCR/ESGR EVS, operating at the flow rate required by TS 4.20, at a Frequency of 18 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the assessment of the MCR/ESGR envelope boundary.
5. The quantitative limits on unfiltered air inleakage into the MCR/ESGR envelope. These limits shall be stated in a manner to allow direct comparison to the unfiltered air inleakage measured by the testing described in paragraph 3. 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 MCR/ESGR envelope occupants to these hazards will be within the assumptions in the licensing basis.
6. The provisions of SR 4.0.2 are applicable to the Frequencies for assessing MCR/ESGR envelope habitability, determining MCR/ESGR envelope unfiltered inleakage, and measuring MCR/ESGR envelope pressure and assessing the MCR/ESGR envelope boundary as required by paragraphs 3 and 4, respectively.

S. Surveillance Frequency Control Program (SFCP)

This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specification are performed at interval sufficient to assure the associated Limiting Conditions for Operation are met.

- a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.
- b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1.
- c. The provisions of Surveillance Requirements 4.0.2 and 4.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.