TABLE 1-1

Frequency Notation

Notation	Test Frequency/Requirements	Surveillance Interval
Shift (S)	At least twice per calendar day	N.A.
Daily (D)	At least once per calendar day	N.A.
Weekly (W)	At least once per week	7 days
Monthly (M)	At least once per month	31 days
Quarterly (Q)	At least once per three months	92 days
Semi-Annually(SA)	At least once per six months	6 months
Annually (A)	At least once per 12 months	12 months
Refueling Interval (R#)	At least once every 24 months	24 months
Refueling Interval (R)	At least once every 18 months	18 months
S/U	Prior to each reactor startup	--
P	Completed prior to each release	--
N.A.	Not Applicable	
Refueling Interval (R##)	At least once every 24 months except a one time extension of the test interval to allow the test to be performed during the refueling outage starting no later than November 19, 2002	--

Table 4.1-1

Minimum Frequencies for Checks, Calibrations and Tests of Instrument Channels

Channel Description	Check	Calibrate	Test	Remarks
1. Nuclear Power Range	S	D (1) M (3)*1	Q (2)	1) Heat balance calibration 2) Signal to delta T; bistable action (permissive, rod stop, trips) 3) Upper and lower chambers for axial offset.
2. Nuclear Intermediate Range	S (1)	N.A.	S/U (2)*2	1) Once/shift when in service 2) Bistable action (permissive, rod stop, trip)
3. Nuclear Source Range	S (1)	N.A.	S/U (2)*2	1) Once/shift when in service 2) Bistable action (alarm, trip)
4. Reactor Coolant Temperature	S	R#	Q (1)	1) Overtemperature - delta T Overpower - delta T
5. Reactor Coolant Flow	S	R#	Q	
6. Pressurizer Water Level	S	R#	Q	
7. Pressurizer Pressure (High & Low)	S	R#	Q	

Table 4.1-1

Minimum Frequencies for Checks, Calibrations and Tests of Instrument Channels

Channel Description	Check	Calibrate	Test	Remarks
8.a 6.9 kV Voltage	N.A.	R#	Q	
8.b 6.9 kV Frequency	N.A.	R#	Q (1) R# (2)	1) Underfrequency relay actuation only. 2) The full test including RCP breaker trip upon underfrequency relay actuation and reactor trip logic relay actuation upon tripping of the RCP breaker.
9. Analog Rod Position	S	R#	M	
10. Rod Position Bank Counters	S	N.A.	N.A.	With analog rod position
11. Steam Generator Level	S	R#	Q	
12. Charging Flow	N.A.	R#	N.A.	
13. Residual Heat Removal Pump Flow	N.A.	R#	N.A.	
14. Boric Acid Tank Level	W	R#	N.A.	
15. Refueling Water Storage Tank Level	W	Q	N.A.	
16. DELETED				
17. Volume Control Tank Level	N.A.	R##	N.A.	
18a. Containment Pressure	D	R#	Q	Wide Range
18b. Containment Pressure	S	R#	Q	Narrow Range

Table 4.1-1

Minimum Frequencies for Checks, Calibrations and Tests of Instrument Channels

	Channel Description	Check	Calibrate	Test	Remarks
18c.	Containment Pressure (PT-3300,PT-3301)	M	R#	N.A.	High Range
19.	Process Radiation Monitoring System	D	R#	M	
19a.	Area Radiation Monitoring System	D	R#	M	
19b.	Area Radiation Monitoring System (VC)	D	R#	M	
20.	Boric Acid Make-up Flow Channel	N.A.	R#	N.A.	
21a.	Containment Sump and Recirculation Sump Level (Discrete)	S	R#	R#	Discrete Level Indication Systems.
21b.	Containment Sump, Recirculation Sump and Reactor Cavity Level (Continuous)	S	R#	R#	Continuous Level Indication Systems.
21c.	Reactor Cavity Level Alarm	N.A.	R#	R#	Level Alarm System
21d.	Containment Sump Discharge Flow	S	R#	M	Flow Monitor

Table 4.1-1

Minimum Frequencies for Checks, Calibrations and Tests of Instrument Channels

	Channel Description	Check	Calibrate	Test	Remarks
21e.	Containment Fan Cooler Condensate Flow	S	R#	M*3	
22a.	Accumulator Level	S	R#	N.A.	
22b.	Accumulator Pressure	S	R#	N.A.	
23.	Steam Line Pressure	S	R#	Q	
24.	Turbine First Stage Pressure	S	R#	Q	
25.	Reactor Trip Logic Channel Testing	N.A.	N.A.	M*9	
26.	Engineered Safety Features (SI) Logic Channel Testing	N.A.	N.A.	M*9	
27.	Turbine Trip a. Low Auto Stop Oil Pressure	N.A.	R#	N.A.	
28.	Control Rod Protection (for use with LOPAR fuel)	N.A.	R#	*4	

Table 4.1-1

Minimum Frequencies for Checks, Calibrations and Tests of Instrument Channels

	Channel Description	Check	Calibrate	Test	Remarks
29.	Loss of Power	N.A.	R#	R#	
	a. 480v Emergency Bus Undervoltage (Loss of Voltage)				
	b. 480v Emergency Bus Undervoltage (Degraded Voltage)	S	R#	M	
	c. 480v Emergency Bus Undervoltage (Alarm)	N.A.	R#	M	
30.	Auxiliary Feedwater				
	a. Steam Generator Water Level (Low-Low)	S	R#	R#	
	b. Low-Low Level AFWS Automatic Actuation Logic	N.A.	N.A.	M	Test one logic channel per month on an alternating basis.
	c. Station Blackout (Undervoltage)	N.A.	R#	R#	
	d. Trip of Main Feedwater Pumps	N.A.	N.A.	R#	
31.	Reactor Coolant System Subcooling Margin Monitor	M	R#	N.A.	
32.	PORV Position Indicator (Limit Switch)	M	R#	R#	

Table 4.1-1

Minimum Frequencies for Checks, Calibrations and Tests of Instrument Channels

	Channel Description	Check	Calibrate	Test	Remarks
33.	PORV Block Valve Position Indicator (Limit Switch)	M*5	R#	R#	
34.	Safety Valve Position Indicator (Acoustic Monitor)	M	R#	R#	
35.	Auxiliary Feedwater Flow Rate	M	R#	R#	
36.	PORV Actuation/ Reclosure Setpoints	N.A.	R#	N.A.	
37.	Overpressure Protection System (OPS)	N.A.	R#	*6	
38.	Wide Range Plant Vent Noble Gas Effluent Monitor (R-27)	S	R#	N.A.	
39.	Main Steam Line Radiation Monitor (R-28, R-29, R-30, R-31)	S	R#	N.A.	
40.	High Range Containment Radiation Monitor (R-25, R-26)	S	R#*7	N.A.	
41.	Containment Hydrogen Monitor	Q	Q*8	N.A.	

Table 4.1-3

Frequencies for Equipment Tests

		Check	Frequency	Maximum Time Between Tests
1.	Control Rods	Rod drop times of all control rods	Refueling # Interval	*
2.	Control Rods	Movement of at least 10 steps in any one direction of all control rods	Quarterly during reactor critical operations	*
3.	Pressurizer Safety Valves	Setpoint	Refueling Interval (R#)	*
4.	Main Steam Safety Valves	Setpoint	Refueling Interval (R#)	*
5.	Containment Isolation System	Automatic Actuation	Refueling Interval (R#)	*
6.	Refueling System Interlocks	Functioning	Each refueling shutdown prior to refueling Operation	Not Applicable
7.	Diesel Fuel Supply	Fuel Inventory	Weekly	10 days
8.	Turbine Steam Stop Control Valves	Closure	**	**
9.	Cable Tunnel Ventilation Fans	Functioning	Monthly	45 days

* See Specification 1.9.

** The turbine steam stop and control valves shall be tested at a frequency determined by the methodology presented in WCAP-11525 "Probabilistic Evaluation of Reduction in Turbine Valve Test Frequency", and in accordance with established NRC acceptance criteria for the probability of a missile ejection incident at IP-2. In no case shall the test interval for these valves exceed one year.

e. Closure of the containment isolation valves for the purpose of the test shall be accomplished by the means provided for normal operation of the valves.

2. Acceptance Criteria

The As Found measured leakage rate shall be less than 1.0 L_a where L_a is equal to 0.1 w/o per day of containment steam air atmosphere at 47 psig and 271°F, which are the peak accident pressure and temperature conditions. Prior to entering a mode where containment integrity is required, the As Left leakage rate shall not exceed 0.75 L_a.

3. Frequency

The integrated leakage rate test frequency shall be performed in accordance with 10 CFR 50 Appendix J, Option B as modified by approved exemptions and in accordance with guidelines contained in Regulatory Guide 1.163, dated September 1995.

B. SENSITIVE LEAKAGE RATE

1. Test

A sensitive leakage rate test shall be conducted with the containment penetrations, weld channels, and certain double-gasketed seals and isolation valve interspaces at a minimum pressure of 52 psig and with the containment building at atmospheric pressure.

2. Acceptance Criteria

The test shall be considered satisfactory if the leak rate for the containment penetrations, weld channel and other pressurized zones is equal to or less than 0.2% of the containment free volume per day.

3. Frequency

A sensitive leakage rate test shall be performed at every Refueling Interval (R#).

C. AIR LOCK TESTS

1. The containment air locks shall be tested at a minimum pressure of 47 psig. The test shall be performed in accordance with 10 CFR 50 Appendix J, Option B, as modified by approved exemptions and in accordance with guidelines contained in Regulatory Guide 1.163, dated September 1995. The acceptance criteria is included in Specification 4.4.D.2.a.

2. Whenever containment integrity is required, verification shall be made of proper repressurization to at least 47 psig of the double-gasket air lock door seal upon closing an air lock door.

D. CONTAINMENT ISOLATION VALVES

1. Tests and Frequency

a. Containment isolation valves shall be tested for operability in accordance with 10 CFR 50 Appendix J, Option B, as modified by approved exemptions and in accordance with guidelines contained in Regulatory Guide 1.163, dated September 1995.

b. Containment Isolation valves in which are pressurized by the Weld Channel and Containment Penetration Pressurization System are leakage tested as part of the Sensitive Leakage Rate Test included in Specification 4.4.B.

c. Containment Isolation valves in which are pressurized by the Isolation Valve Seal Water System shall be tested at every refueling but in no case at intervals greater than a Refueling Interval (R#), as part of an overall Isolation Valve Seal Water System Test.

2. Acceptance Criteria

a. The combined leakage rate for the following shall be less than 0.6 L_a: Containment isolation valves listed in subject to gas or nitrogen pressurization testing, air lock testing as specified in Specification 4.4.C.1, portions of the sensitive leakage rate test described in Specification 4.4.B.1 which pertain to containment penetrations and double-gasketed seals.

b. The leakage rate into containment for the isolation valves sealed with the service water system shall not exceed 0.36 gpm per fan cooler.

c. The leakage rate for the Isolation Valve Seal Water System shall not exceed 14,700 cc/hr.

E. CONTAINMENT MODIFICATIONS

Any major modification or replacement of components of the containment performed after the initial pre-operational leakage rate test shall be followed by either an integrated leakage rate test or a local leak detection test and shall meet the appropriate acceptance criteria of Specifications 4.4.A.2, 4.4.B.2, or 4.4.D.2. Modifications or replacements performed directly prior to the conduct of an integrated leakage rate test shall not require a separate test.

F. REPORT OF TEST RESULTS

A post-outage report shall be prepared presenting results of the previous cycle's Type B and Type C tests, and Type A, Type B, and Type C tests, if performed during that outage. The technical contents of the report are generally described in ANSI/ANS 56.8-1994, and will be available on-site for NRC review. The report shall also show that the applicable performance criteria are met and serves as a record that continuing performance is acceptable.

G. VISUAL INSPECTION

A detailed visual examination of the accessible interior and exterior surfaces of the containment structure and its components shall be performed at each Refueling Interval (R#) and prior to any integrated leak test to uncover any evidence of deterioration which may affect either the containment structural integrity or leak-tightness. The discovery of any significant deterioration shall be accompanied by corrective actions in accordance with acceptable procedures, non-destructive tests and inspections, and local testing where practical, prior to the conduct of any integrated leak test. Such repairs shall be

4.5 ENGINEERED SAFETY FEATURES

Applicability

Applies to testing of the Safety Injection System, the Containment Spray System, the Hydrogen Recombiner System, and the Air Filtration System.

Objective

To verify that the subject systems will respond promptly and perform their design functions, if required.

Specifications

A. SYSTEM TESTS

1. Safety Injection System

a. System tests shall be performed at each reactor Refueling Interval (R#). With the Reactor Coolant System pressure less than or equal to 350 psig and temperature less than or equal to 350°F, a test safety injection signal will be applied to initiate operation of the system. The safety injection pumps are made inoperable for this test.

b. The test will be considered satisfactory if control board indication and visual observations indicate that all components have received the safety injection signal in the proper sequence and timing; that is, the appropriate pump breakers shall have opened and closed, and the appropriate valves shall have completed their travel.

c. Conduct a flow test of the high head safety injection system after any modification is made to either its piping and/or valve arrangement.

d. Verify that the mechanical stops on Valves 856 A, C, D and E are set at the position measured and recorded during the most recent ECCS operational flow test or flow tests performed in accordance with (c) above. This surveillance procedure shall be performed following any maintenance on these valves or their associated motor operators and at a convenient outage if the position of the mechanical stops has not been verified in the preceding three months.

B. CONTAINMENT SPRAY SYSTEM

1. System tests shall be performed at each reactor Refueling Interval (R#). The tests shall be performed with the isolation valves in the spray supply lines at the containment blocked closed. Operation of the system is initiated by tripping the normal actuation instrumentation.

2. The spray nozzles shall be tested for proper functioning at least every five years.

3. The test will be considered satisfactory if visual observations indicate all components have operated satisfactorily.

C. HYDROGEN RECOMBINER SYSTEM

1. Visual Inspection of both PARs at each refueling outage (#) shall be done to verify that there is no significant fouling by foreign materials.

2. A sample plate from each PAR shall be removed at each refueling outage and tested to verify response to a hydrogen mixture test gas.

D. CONTAINMENT FAN COOLER SYSTEM

Each fan cooler unit specified in Specification 3.3.B shall be demonstrated to be operable:

1. At least once monthly by initiating, from the control room, flow through the unit and verifying that the unit operates for at least 15 minutes.

2. At least once every Refueling Interval (#) by verifying a system flow rate at ambient conditions greater than or equal to 64,500 cfm.

4. At least once every Refueling Interval (#) by:

   a. verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches water gauge while operating the system at ambient conditions and at a flow rate of 2000 cfm ±10%.

   b. verifying that, on a Safety Injection Test Signal or a high radiation signal in the control room, the system automatically switches into a filtered intake mode of operation with flow through the HEPA filters and charcoal adsorber banks.

   c. verifying that the system maintains the control room at positive pressure relative to the adjacent areas during the pressurization mode of operation at a makeup flow rate of 2000 cfm ±10%.

5. After each complete or partial replacement of an HEPA filter bank, by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of 2000 cfm ±10%.

6. After each complete or partial replacement of a charcoal adsorber bank, by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of 2000 cfm ±10%.

F. FUEL STORAGE BUILDING AIR FILTRATION SYSTEM

The fuel storage building air filtration system specified in Specification 3.8 shall be demonstrated operable:

1. At least once per 31 days by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 15 minutes.

Thus, the allowable methyl iodide penetration, by system, is as follows:

TS Sec.	System Name	Filter Efficiency	UFSAR Reference	Allowable Methyl Iodide Penetration
4.5.E	Control Room Air Filtration System	90%	Sec. 14.3.6.5	5.0%
4.5.F	Fuel Storage Building Air Filtration System	85%	Table 14.2-2	7.5%
4.5.G	Post-Accident Containment Venting System	70%	Sec. 14.3.6.1.3	15.0%

While UFSAR Sections 14.3.6.1.3 and 14.3.6.5 provide filter efficiencies for methyl iodide, UFSAR Table 14.2-2 just provides a combined iodide (methyl iodide and elemental iodide) efficiency. Since the methyl iodide efficiency is lower than the combined iodide efficiency, the use of the combined iodide efficiency provides a more conservative limit for testing purposes.

References

(1) UFSAR Section 6.2
(2) UFSAR Section 6.4
(3) NRC Generic Letter 99-02, dated June 3, 1999
(4) UFSAR Table 14.2-2
(5) UFSAR Section 14.3.6.1.3
(6) UFSAR Section 14.3.6.5

4.6 EMERGENCY POWER SYSTEM PERIODIC TESTS

Applicability

Applies to periodic testing and surveillance requirements of the emergency power systems.

Objective

To verify that emergency power systems will respond promptly and properly when required.

Specifications

The following tests and surveillances shall be performed as stated:

A. DIESEL GENERATORS

1. Each month, each diesel generator shall be manually started and synchronized to its bus or buses and shall be allowed to assume the normal bus load.

2. At each Refueling Interval (R##), each diesel generator shall be manually started, synchronized and loaded up to its continuous (nameplate) and short term ratings.

3. At each Refueling Interval (R#), to assure that each diesel generator will automatically start and assume the required load within 60 seconds after the initial start signal, the following shall be accomplished: by simulating a loss of all normal AC station service power supplies and simultaneously simulating a Safety Injection signal, observations shall verify automatic start of each diesel generator, required bus load shedding and restoration to operation of particular vital equipment. To prevent Safety Injection flow to the core, certain safeguards valves will be closed and made inoperable.

   The above tests will be considered satisfactory if the required minimum safeguards equipment operated as designed.

B. DIESEL FUEL TANKS

A minimum oil storage of 48,000 gallons will be maintained for the station at all times.

C. STATION BATTERIES (NOS. 21, 22, 23, & 24)

1. Every month, the voltage of each cell, the specific gravity and temperature of a pilot cell in each battery and each battery voltage shall be measured and recorded.

2. Every 3 months, each battery shall be subjected to a 24-hour equalizing charge, and the specific gravity of each cell, the temperature reading of every fifth cell, the height of electrolyte, and the amount of water added shall be measured and recorded.

3. Each time data is recorded, new data shall be compared with old to detect signs of abuse or deterioration.

4. At least once every Refueling Interval (R#) each battery shall be subjected to a load test and a visual inspection of the plates.

D. GAS TURBINE GENERATORS

1. At monthly intervals, at least one gas turbine generator shall be started and synchronized to the power distribution system for a minimum of thirty (30) minutes with a minimum electrical output of 750 kW.

Table 4.10-2

Radioactive Liquid Effluent Monitoring Instrumentation Surveillance Requirements

Instrument	Channel Check	Source Check	Channel Calibration	Channel Functional Test
1. GROSS RADIOACTIVITY MONITORS PROVIDING ALARM AND AUTOMATIC TERMINATION OF RELEASE				
a. Liquid Radwaste Effluent Line	D*	P	R(3)#	Q(1)(5)
b. Steam Generator Blowdown Effluent Line	D*	M	R(3)#	Q(1)(5)
2. GROSS BETA OR GAMMA RADIOACTIVITY MONITORS PROVIDING ALARM BUT NOT PROVIDING AUTOMATIC TERMINATION OF RELEASE				
a. Service Water System Effluent Line	D*	M	R(3)#	Q(2)(5)
b. Unit 1 Secondary Boiler Blowdown Effluent Line	D*	M	R(3)#	Q(2)(5)
3. FLOW RATE MEASUREMENTS DEVICES				
a. Liquid Radwaste Effluent Line	D(4)	N.A.	R#	Q
b. Steam Generator Blowdown Effluent Line	D(4)	N.A.	R#	Q
4. TANK LEVEL INDICATING DEVICES***				
a. 13 Waste Distillate Storage Tank	D**	N.A.	R#	Q
b. 14 Waste Distillate Storage Tank	D**	N.A.	R#	Q
c. Primary Water Storage Tank	D**	N.A.	R#	Q
d. Refueling Water Storage Tank	D**	N.A.	Q	Q

Table 4.10-4

Radioactive Gaseous Effluent Monitoring Instrumentation Surveillance Requirements

Instrument		Channel Check	Source Check	Channel Calibration	Channel Functional Test	Modes In Which Surveillance Required
1.	WASTE GAS HOLDUP SYSTEM					
a.	Noble Gas Activity Providing Alarm	D	M	R[3]#	Q[2][6]	*
2.	WASTE GAS HOLDUP SYSTEM EXPLOSIVE GAS MONITORING SYSTEM					
a.	Hydrogen Monitor	D	N.A.	Q[4]	M	**
b.	Hydrogen or Oxygen Monitor	D	N.A.	Q[5]	M	**
3.	CONDENSER EVACUATION SYSTEM					
a.	Noble Gas Activity	D	M	R[3]#	Q[2] [6]	*
4.	PLANT VENT					
a.	Noble Gas Activity Monitor	D	M	R[3]#	Q[1] [6]	*
b.	Iodine Sampler	W	N.A.	N.A.	N.A.	*
c.	Particulate Sampler	W	N.A.	N.A.	N.A.	*
d.	Flow Rate Monitor	D	N.A.	R#	N.A.	*
e.	Sampler Flow Rate Monitor	D	N.A.	R#	N.A.	*
5.	STACK VENT					
a.	Noble Gas Activity Monitor	D	P	R[3]#	Q[2] [6]	*
b.	Iodine Sampler	W	N.A.	N.A.	N.A.	*
c.	Particulate Sampler	W	N.A.	N.A.	N.A.	*
d.	Flow Rate Monitor	D	N.A.	R#	N.A.	*
e.	Sampler Flow Rate Monitor	D	N.A.	R#	N.A.	*

Note 3: If the number of unacceptable snubbers is equal to or less than the number in Column A, the next inspection interval may be twice the previous interval but not greater than 48 months.

Note 4: If the number of unacceptable snubbers is equal to or less than the number of Column B, but greater than the number in Column A, the next inspection interval shall be the same as the previous interval.

Note 5: If the number of unacceptable snubbers is equal to or greater than the number in Column C, the next inspection interval shall be two-thirds of the previous interval. However, if the number of unacceptable snubbers is less than the number in Column C, but greater than the number in Column B, the next interval shall be reduced proportionally by interpolation, that is, the previous interval shall be reduced by a factor that is one-third of the ratio of the difference between the number of unacceptable snubbers found during the previous interval and the number in Column B to the difference in the numbers in Column B and C.

Note 6: The provisions of Specification 4.0.1 are applicable for all inspection intervals.

Snubbers are categorized as accessible or inaccessible during reactor operation. These two groups may be inspected independently according to the above schedule except as noted below.

Visual inspection shall verify that (1) there is no visual indication of damage or impaired operability, (2) attachments to the foundation or supporting structure are secure, and (3) in those locations where snubber movement can be manually induced without disconnecting the snubber, the snubber has freedom of movement and is not frozen. Snubbers which appear

C. FUNCTIONAL TEST ACCEPTANCE CRITERIA

The snubber functional test shall verify that:

1. Activation (restraining action) is achieved within the specified range of velocity or acceleration in both tension and compression.

2. Snubber bleed, or release rate, where required, is within the specified range in compression or tension. For snubbers specifically required to not displace under continuous load, the ability of the snubber to withstand load without displacement shall be verified.

D. RECORD OF SNUBBER SERVICE LIFE

A record of the service life of each snubber, the date at which the designated service life commences and the installation and maintenance records on which the designated service life is based shall be maintained as required by Specification 6.10.2.n. Concurrently with the first visual inspection and at least once during every Refueling Interval (R#), the installation and maintenance records for each snubber shall be reviewed to verify that the indicated service life has not been exceeded or will not be exceeded prior to the next scheduled snubber service life review. If the indicated service life will be exceeded prior to the next scheduled snubber service life review, the snubber service life shall be re-evaluated or the snubber shall be replaced or reconditioned so as to extend its service life beyond the date of the next scheduled service life review. This re-evaluation, replacement, or reconditioning shall be indicated in the records.