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

April 8, 2021

Mr. Cleveland Reasoner
Chief Executive Officer and
Chief Nuclear Officer
Wolf Creek Nuclear Operating Corporation
P.O. Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION, UNIT 1 - ISSUANCE OF AMENDMENT NO. 227 RE: TECHNICAL SPECIFICATION CHANGE REGARDING RISK-INFORMED JUSTIFICATION FOR THE RELOCATION OF SPECIFIC SURVEILLANCE FREQUENCY REQUIREMENTS TO A LICENSEE CONTROLLED PROGRAM BASED ON TSTF-425 (EPID L-2020-LLA-0091)

Dear Mr. Reasoner:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 227 to Renewed Facility Operating License No. NPF-42 for the Wolf Creek Generating Station, Unit 1. The amendment consists of changes to the technical specifications in response to your application dated April 27, 2020, as supplemented by letter dated October 26, 2020.

The amendment revises the technical specifications by relocating specific surveillance frequencies to a licensee-controlled program with the implementation of Nuclear Energy Institute (NEI) 04-10, “Risk-Informed Technical Specification Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies.” The changes are consistent with Technical Specifications Task Force (TSTF) Traveler (TSTF-425), Revision 3, “Relocate Surveillance Frequencies to Licensee Control – RITSTF [Risk-Informed TSTF] Initiative 5b.”

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

Sincerely,

/RA/

Samson S. Lee, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosures:
1. Amendment No. 227 to NPF-42
2. Safety Evaluation

cc: Listserv

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

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION, UNIT 1

DOCKET NO. 50-482

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 227
License No. NPF-42

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

A. The application for amendment to the Wolf Creek Generating Station, Unit 1 (the facility) Renewed Facility Operating License No. NPF-42 filed by the Wolf Creek Nuclear Operating Corporation (the Corporation), dated April 27, 2020, as supplemented by letter dated October 26, 2020, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

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

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

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

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

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-42 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 227, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the license. The Corporation shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and shall be implemented within 90 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jennifer L. Dixon-Herrity

Digitally signed by Jennifer L. Dixon-Herrity
Date: 2021.04.08 13:03:18 -04'00'

Jennifer L. Dixon-Herrity, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License and
Technical Specifications

Date of Issuance: April 8, 2021

ATTACHMENT TO LICENSE AMENDMENT NO. 227 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-42

WOLF CREEK GENERATING STATION, UNIT 1

DOCKET NO. 50-482

Replace the following pages of Renewed Facility Operating License No. NPF-42 and the Appendix A, Technical Specifications, with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Renewed Facility Operating License

REMOVE	INSERT
4	4

Technical Specifications

Remove	Insert	Remove	Insert
i	i	3.3-20	3.3-20
ii	ii	3.3-21	3.3-21
1.1-6	1.1-6	3.3-22	3.3-22
3.1-1	3.1-1	3.3-23	3.3-23
3.1-3	3.1-3	3.3-24	3.3-24
3.1-10	3.1-10	3.3-25	3.3-25
3.1-12	3.1-12	3.3-26	3.3-26
3.1-15	3.1-15	3.3-27	3.3-27
3.1-20	3.1-20	3.3-28	3.3-28
3.1-22	3.1-22	3.3-29	3.3-29
3.2-3	3.2-3	3.3-30	3.3-30
3.2-5	3.2-5	3.3-31	3.3-31
3.2-8	3.2-8	3.3-32	3.3-32
3.2-9	3.2-9	3.3-33	3.3-33
3.2-13	3.2-13	3.3-34	3.3-34
3.3-10	3.3-10	3.3-35	3.3-35
3.3-11	3.3-11	3.3-36	3.3-36
3.3-12	3.3-12	3.3-37	3.3-37
3.3-13	3.3-13	3.3-38	3.3-38
3.3-14	3.3-14	3.3-39	3.3-39
3.3-15	3.3-15	3.3-40	3.3-40
3.3-16	3.3-16	3.3-41	3.3-41
3.3-17	3.3-17	3.3-42	3.3-42
3.3-18	3.3-18	3.3-43	3.3-43
3.3-19	3.3-19	3.3-44	3.3-44

Technical Specifications (continued)

Remove	Insert	Remove	Insert
3.3-45	3.3-45	3.5-7	3.5-7
3.3-46	3.3-46	3.5-8	3.5-8
3.3-47	3.3-47	3.5-9	3.5-9
3.3-48	3.3-48	3.5-10	3.5-10
3.3-49	3.3-49	3.5-11	3.5-11
3.3-50	3.3-50	3.5-12	3.5-12
3.3-51	3.3-51	---	3.5-13
3.3-52	3.3-52	3.6-6	3.6-6
3.3-53	3.3-53	3.6-11	3.6-11
3.3-54	3.3-54	3.6-12	3.6-12
3.3-55	3.3-55	3.6-13	3.6-13
3.3-56	3.3-56	3.6-14	3.6-14
3.3-57	3.3-57	3.6-15	3.6-15
3.3-58	3.3-58	3.6-17	3.6-17
---	3.3-59	3.6-18	3.6-18
---	3.3-60	3.6-19	3.6-19
3.4-3	3.4-3	3.6-20	3.6-20
3.4-4	3.4-4	3.6-21	3.6-21
3.4-5	3.4-5	3.7-7	3.7-7
3.4-7	3.4-7	3.7-8	3.7-8
3.4-8	3.4-8	3.7-12	3.7-12
3.4-11	3.4-11	3.7-14	3.7-14
3.4-13	3.4-13	3.7-16	3.7-16
3.4-14	3.4-14	3.7-17	3.7-17
3.4-16	3.4-16	3.7-19	3.7-19
3.4-17	3.4-17	3.7-21	3.7-21
3.4-19	3.4-19	3.7-23	3.7-23
3.4-21	3.4-21	3.7-25	3.7-25
3.4-26	3.4-26	3.7-28	3.7-28
3.4-30	3.4-30	3.7-31	3.7-31
3.4-31	3.4-31	3.7-35	3.7-35
3.4-33	3.4-33	3.7-36	3.7-36
3.4-36	3.4-36	3.7-38	3.7-38
3.4-37	3.4-37	3.7-40	3.7-40
3.4-41	3.4-41	3.7-43	3.7-43
3.4-43	3.4-43	3.7-45	3.7-45
3.5-2	3.5-2	3.7-47	3.7-47
3.5-3	3.5-3	3.8-7	3.8-7
3.5-4	3.5-4	3.8-8	3.8-8
3.5-5	3.5.5	3.8-9	3.8-9
3.5-6	3.5-6	3.8-10	3.8-10

Technical Specifications (continued)

Remove	Insert	Remove	Insert
3.8-11	3.8-11	3.8-34	3.8-34
3.8-12	3.8-12	3.8-36	3.8-36
3.8-13	3.8-13	3.8-38	3.8-38
3.8-14	3.8-14	3.8-40	3.8-40
3.8-15	3.8-15	3.9-1	3.9-1
3.8-16	3.8-16	3.9-2	3.9-2
3.8-17	3.8-17	3.9-4	3.9-4
3.8-23	3.8-23	3.9-6	3.9-6
3.8-24	3.8-24	3.9-8	3.9-8
3.8-25	3.8-25	3.9-10	3.9-10
3.8-26	3.8-26	3.9-11	3.9-11
3.8-27	3.8-27	5.0-18	5.0-18
3.8-31	3.8-31	5.0-22	5.0-22
3.8-32	3.8-32	5.0-23	5.0-23

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

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

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

(1) Maximum Power Level

The Operating Corporation is authorized to operate the facility at reactor core power levels not in excess of 3565 megawatts thermal (100% power) in accordance with the conditions specified herein.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 227, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the license. The Corporation shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Antitrust Conditions

Kansas Gas & Electric Company and Kansas City Power & Light Company shall comply with the antitrust conditions delineated in Appendix C to this license.

(4) Environmental Qualification (Section 3.11, SSER #4, Section 3.11, SSER #5)*

Deleted per Amendment No. 141.

*The parenthetical notation following the title of many license conditions denotes the section of the supporting Safety Evaluation Report and/or its supplements wherein the license condition is discussed.

TABLE OF CONTENTS

1.1 Definitions (continued)

SLAVE RELAY TEST	A SLAVE RELAY TEST shall consist of energizing all slave relays in the channel required for channel OPERABILITY and verifying the OPERABILITY of each required slave relay. The SLAVE RELAY TEST shall include, a continuity check of associated required testable actuation devices. The SLAVE RELAY TEST may be performed by means of any series of sequential, overlapping, or total steps.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.
TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT)	A TADOT shall consist of operating the trip actuating device and verifying the OPERABILITY of all devices in the channel required for trip actuating device OPERABILITY. The TADOT shall include adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the necessary accuracy. The TADOT may be performed by means of any series of sequential, overlapping, or total channel steps.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM)

LCO 3.1.1 SDM shall be within the limit provided in the COLR.

APPLICABILITY: MODE 2 with $k_{eff} < 1.0$,
MODES 3, 4, and 5.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SDM not within limit.	A.1 Initiate boration to restore SDM to within limit.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.1	Verify SDM to be within limit.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	----------NOTE---------- The predicted reactivity values may be adjusted (normalized) to correspond to the measured core reactivity prior to exceeding a fuel burnup of 60 effective full power days (EFPD) after each fuel loading. ----------	
	Verify measured core reactivity is within $\pm$ 1% Δk/k of predicted values.	Once prior to entering MODE 1 after each refueling AND --------NOTE-------- Only required after 60 EFPD ---------- In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify individual rod positions within alignment limit.	In accordance with the Surveillance Frequency Control Program
SR 3.1.4.2	Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core $\geq$ 10 steps in either direction.	In accordance with the Surveillance Frequency Control Program
SR 3.1.4.3	Verify rod drop time of each rod, from the fully withdrawn position, is $\leq$ 2.7 seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with: a. $T_{avg} \geq 500°F$; and b. All reactor coolant pumps operating.	Prior to reactor criticality after each removal of the reactor head

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each shutdown bank is within the limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.6.2	Verify each control bank insertion is within the limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.1.6.3	Verify sequence and overlap limits specified in the COLR are met for control banks not fully withdrawn from the core.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. RCS lowest operating loop average temperature not within limit.	C.1 Restore RCS lowest operating loop average temperature to within limit.	15 minutes
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Perform a CHANNEL OPERATIONAL TEST on power range and intermediate range channels per SR 3.3.1.8 and Table 3.3.1-1.	Prior to initiation of PHYSICS TESTS
SR 3.1.8.2	Verify the RCS lowest operating loop average temperature is $\geq$ 541°F.	In accordance with the Surveillance Frequency Control Program
SR 3.1.8.3	Verify THERMAL POWER is $\leq$ 5% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.1.8.4	Verify SDM is within limits provided in the COLR.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.9.1	Verify RCS boron concentration is greater than the ARO critical boron concentration.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

----------NOTE----------
During power escalation following shutdown, THERMAL POWER may be increased until an equilibrium power level has been achieved, at which a power distribution measurement is obtained.

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify $F_Q^C(Z)$ is within limit.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP AND Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified AND In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.2.1.2 (continued)	Once within 24 hours after achieving equilibrium conditions after exceeding, by $\geq$ 10% RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified AND In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

----------NOTE----------
During power escalation following shutdown, THERMAL POWER may be increased until an equilibrium power level has been achieved, at which a power distribution measurement is obtained.

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify $F^N_{\Delta H}$ is within limits specified in the COLR.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP AND In accordance with the Surveillance Frequency Control Program

3.2 POWER DISTRIBUTION LIMITS

3.2.3 AXIAL FLUX DIFFERENCE (AFD) (Relaxed Axial Offset Control (RAOC) Methodology)

LCO 3.2.3 The AFD in % flux difference units shall be maintained within the limits specified in the COLR.

----------NOTE----------
The AFD shall be considered outside limits when two or more OPERABLE excore channels indicate AFD to be outside limits.

APPLICABILITY: MODE 1 with THERMAL POWER ≥ 50% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. AFD not within limits.	A.1 Reduce THERMAL POWER to < 50% RTP.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify AFD within limits for each OPERABLE excore channel.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.4.1	----------NOTES---------- 1. With input from one Power Range Neutron Flux channel inoperable and THERMAL POWER ≤ 75% RTP, the remaining three power range channels can be used for calculating QPTR. 2. SR 3.2.4.2 may be performed in lieu of this Surveillance. --- Verify QPTR is within limit by calculation.	In accordance with the Surveillance Frequency Control Program
SR 3.2.4.2	----------NOTE---------- Not required to be performed until 12 hours after input from one Power Range Neutron Flux channel is inoperable with THERMAL POWER > 75% RTP. --- Verify QPTR is within limit using core power distribution measurement information.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
X. Required Action and associated Completion Time of Condition W not met. OR Two or more channels inoperable.	X.1.1 Initiate action to fully insert all rods. AND X.1.2 Initiate action to place the Rod Control System in a condition incapable of rod withdrawal. OR X.2 Initiate action to borate the RCS to greater than all rods out (ARO) critical boron concentration.	Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.1-1 to determine which SRs apply for each RTS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.2	----------NOTES---------- Not required to be performed until 24 hours after THERMAL POWER is ≥ 15% RTP. ---------- Compare results of calorimetric heat balance calculation to power range channel output. Adjust power range channel output if calorimetric heat balance calculation results exceed power range channel output by more than + 2% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.3	----------NOTES---------- Not required to be performed until 24 hours after THERMAL POWER is ≥ 50% RTP. ---------- Compare results of the core power distribution measurements to Nuclear Instrumentation System (NIS) AFD. Adjust NIS channel if absolute difference is ≥ 3%.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.4	----------NOTE---------- This Surveillance must be performed on the reactor trip bypass breaker for the local manual shunt trip only prior to placing the bypass breaker in service. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.5	Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.6	----------NOTE---------- Not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 75 % RTP. ---------- Calibrate excore channels to agree with core power distribution measurements.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.7	----------NOTES---------- 1. Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. 2. Source range instrumentation shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ---------- Perform COT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.8	----------NOTE---------- This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ---------- Perform COT.	--------NOTE-------- Only required when not performed within the Frequency specified in the Surveillance Frequency Control Program ---------- (continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.8 (continued		Prior to reactor startup AND Twelve hours after reducing power below P-10 for power and intermediate instrumentation AND Four hours after reducing power below P-6 for source range instrumentation AND In accordance with the Surveillance Frequency Control Program
SR 3.3.1.9	----------NOTE---------- Verification of setpoint is not required. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.10	----------NOTE---------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ---------- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.11	----------NOTES---------- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. This Surveillance shall include verification that the time constants are adjusted to the prescribed values. 3. Power and intermediate range detector plateau voltage verification is not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER $\geq$ 95% RTP. ---------- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.12	Not Used.	
SR 3.3.1.13	Perform COT.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.14	----------NOTE---------- Verification of setpoint is not required. ----------	
	Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.15	----------NOTE---------- Verification of setpoint is not required. ----------	
	Perform TADOT.	Prior to exceeding the P-9 interlock whenever the unit has been in MODE 3, if not performed in the previous 31 days
SR 3.3.1.16	----------NOTE---------- Neutron detectors are excluded from response time testing. ----------	
	Verify RTS RESPONSE TIMES are within limits.	In accordance with the Surveillance Frequency Control Program

Table 3.3.1-1 (page 1 of 6)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE [a]
1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.14	NA
	3[b], 4[b], 5[b]	2	C	SR 3.3.1.14	NA
2. Power Range Neutron Flux					
a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 112.3% RTP
b. Low	1[c], 2[f]	4	V	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 28.3% RTP
	2[h], 3[i]	4	W, X	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 28.3% RTP
3. Power Range Neutron Flux Rate					
a. High Positive Rate	1,2	4	E	SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 6.3% RTP with time constant ≥ 2 sec
b. High Negative Rate	1,2	4	E	SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤6.3% RTP with time constant ≥ 2 sec
4. Intermediate Range Neutron Flux	1[c], 2[d]	2	F,G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 35.3% RTP

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(b) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(c) Below the P-10 (Power Range Neutron Flux) interlock.
(d) Above the P-6 (Intermediate Range Neutron Flux) interlock.
(f) With $k_eff \geq 1.0$.
(h) With $k_eff < 1.0$, and all RCS cold leg temperatures ≥ 500° F, and RCS boron concentration ≤ the rods out (ARO) critical boron concentration, and Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(i) With all RCS cold leg temperatures ≥ 500° F, and RCS boron concentration ≤ the ARO critical boron concentration, and Rod Control System capable of rod withdrawal or one or more rods not fully inserted.

Table 3.3.1-1 (page 2 of 6)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (a)
5.	Source Range Neutron Flux	2(e)	2	I,J	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 1.6 E5 cps
		3(b), 4(b), 5(b)	2	J,K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.11	≤ 1.6 E5 cps
6.	Overtemperature ΔT	1,2	4	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	Refer to Note 1 (Page 3.3-20)
7.	Overpower ΔT	1,2	4	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	Refer to Note 2 (Page 3.3-21)
8.	Pressurizer Pressure					
	a. Low	1(g)	4	M	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 1930 psig
	b. High	1,2	4	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≤ 2395 psig
9.	Pressurizer Water Level - High	1(g)	3	M	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ 93.9% of instrument span
10.	Reactor Coolant Flow - Low	1(g)	3 per loop	M	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 88.9% of normalized flow

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(b) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(e) Below the P-6 (Intermediate Range Neutron Flux) interlock.
(g) Above the P-7 (Low Power Reactor Trips Block) interlock.

Table 3.3.1-1 (page 3 of 6)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (a)
11.	Not Used.					
12.	Undervoltage RCPs	1(g)	2/bus	M	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.16	≥ 10355 Vac
13.	Underfrequency RCPs	1(g)	2/bus	M	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.16	≥ 57.1 Hz
14.	Steam Generator (SG) Water Level Low-Low (l)	1,2	4 per gen	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 22.3% of Narrow Range Instrument Span
15.	Not Used.					
16.	Turbine Trip					
	a. Low Fluid Oil Pressure	1(j)	3	O	SR 3.3.1.10 SR 3.3.1.15	≥ 534.20 psig
	b. Turbine Stop Valve Closure	1(j)	4	P	SR 3.3.1.10 SR 3.3.1.15	≥ 1% open
17.	Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS)	1,2	2 trains	Q	SR 3.3.1.14	NA
18.	Reactor Trip System Interlocks					
	a. Intermediate Range Neutron Flux, P-6	2(e)	2	S	SR 3.3.1.11 SR 3.3.1.13	≥ 6E-11 amp
	b. Low Power Reactor Trips Block, P-7	1	1 per train	T	SR 3.3.1.5	NA
	c. Power Range Neutron Flux, P-8	1	4	T	SR 3.3.1.11 SR 3.3.1.13	≤ 51.3% RTP

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(e) Below the P-6 (Intermediate Range Neutron Flux) interlocks.
(g) Above the P-7 (Low Power Reactor Trips Block) interlock.
(l) The applicable MODES for these channels are more restrictive in Table 3.3.2-1. (See Function 6.d.)
(j) Above the P-9 (Power Range Neutron Flux) interlock.

Table 3.3.1-1 (page 4 of 6)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (a)
18.	(continued)					
	d. Power Range Neutron Flux, P-9	1	4	T	SR 3.3.1.11 SR 3.3.1.13	≤ 53.3% RTP
	e. Power Range Neutron Flux, P-10	1,2	4	S	SR 3.3.1.11 SR 3.3.1.13	≥ 6.7% RTP and ≤ 13.3% RTP
	f. Turbine Impulse Pressure, P-13	1	2	T	SR 3.3.1.10 SR 3.3.1.13	≤ 12.4% turbine power
19.	Reactor Trip Breakers (RTB) (k)	1,2	2 trains	R	SR 3.3.1.4	NA
		3(b), 4(b), 5(b)	2 trains	C	SR 3.3.1.4	NA
20.	Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms (k)	1,2	1 each per RTB	U	SR 3.3.1.4	NA
		3(b), 4(b), 5(b)	1 each per RTB	C	SR 3.3.1.4	NA
21.	Automatic Trip Logic	1,2	2 trains	Q	SR 3.3.1.5	NA
		3(b), 4(b), 5(b)	2 trains	C	SR 3.3.1.5	NA

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(b) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(k) Including any reactor trip bypass breakers that are racked in and closed for bypassing an RTB.

Table 3.3.1-1 (page 5 of 6)
Reactor Trip System Instrumentation

Note 1: Overtemperature ΔT

The Overtemperature ΔT Function Allowable Value shall not exceed the following Trip Setpoint by more than 1.3% of ΔT span.

$$\Delta T \frac{(1+\tau_1 s)}{(1+\tau_2 s)}\left(\frac{1}{1+\tau_3 s}\right) \leq \Delta T_O \left\{ K_1 - K_2 \frac{(1+\tau_4 s)}{(1+\tau_5 s)}\left[T\left(\frac{1}{(1+\tau_6 s)}\right) - T' \right] + K_3 (P - P') - f_1(\Delta I) \right\}$$

Where: ΔT is measured RCS ΔT, °F.
ΔT_0 is the indicated ΔT at RTP, °F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature, °F.
T′ is the nominal T_{avg} at RTP, ≤ *.

P is the measured pressurizer pressure, psig.
P′ is the nominal RCS operating pressure ≥ * psig.

K_1 = *	K_2 = * /°F	K_3 = * /psig
τ_1 = * sec	τ_2 = * sec	τ_3 = * sec
τ_4 = * sec	τ_5 = * sec	τ_6 = * sec

$f_1(\Delta I)$ =	* { * % + (q_t - q_b)}	when q_t - q_b < * % RTP
	0% of RTP	when * % RTP ≤ q_t - q_b ≤ * % RTP
	* {(q_t - q_b) - * % }	when q_t - q_b > * % RTP

where q_t and q_b are percent RTP in the upper and lower halves of the core, respectively, and q_t + q_b is the total THERMAL POWER in percent RTP.

The values denoted with * are specified in the COLR.

Table 3.3.1-1 (page 6 of 6)
Reactor Trip System Instrumentation

Note 2: Overpower ΔT

The Overpower ΔT Function Allowable Value shall not exceed the following Trip Setpoint by more than 2.6% of ΔT span.

$$\Delta T \frac{(1+\tau_1 s)}{(1+\tau_2 s)}\left(\frac{1}{1+\tau_3 s}\right) \le \Delta T_O \left\{ K_4 - K_5 \frac{(\tau_7 s)}{(1+\tau_7 s)}\left(\frac{1}{1+\tau_6 s}\right) T - K_6 \left[T \frac{1}{(1+\tau_6 s)} - T'' \right] - f_2(\Delta I) \right\}$$

Where: ΔT is measured RCS ΔT, °F.
ΔT_0 is the indicated ΔT at RTP, °F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature, °F.
T″ is the indicated T_{avg} at RTP (Calibration temperature for ΔT instrumentation), ≤ * °F.

K_4 = *

K_5 = * /°F for increasing T_{avg}
* /°F for decreasing T_{avg}

K_6 = * /°F when T > T″
* /°F when T ≤ T″

τ_1 = * sec

τ_2 = * sec

τ_3 = * sec

τ_6 = * sec

τ_7 = * sec

$f_2(\Delta I)$ = *

The values denoted with * are specified in the COLR.

3.3 INSTRUMENTATION

3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

LCO 3.3.2 The ESFAS instrumentation for each Function in Table 3.3.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2-1.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or train(s).	Immediately
B. One channel or train inoperable.	B.1 Restore channel or train to OPERABLE status. OR B.2.1 Be in MODE 3. AND B.2.2 Be in MODE 5.	48 hours 54 hours 84 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One train inoperable.	----------NOTE---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ----------		
	C.1	----------NOTE---------- Only required if Function 3.a.(2) is inoperable. ----------	
		Place and maintain containment purge supply and exhaust valves in closed position.	Immediately
	AND		
	C.2	Restore train to OPERABLE status.	24 hours
	OR		
	C.3.1	Be in MODE 3.	30 hours
	AND		
	C.3.2	Be in MODE 5.	60 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One channel inoperable.	----------NOTE---------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ----------	
	D.1 Place channel in trip.	72 hours
	OR	
	D.2.1 Be in MODE 3.	78 hours
	AND	
	D.2.2 Be in MODE 4.	84 hours
E. One Containment Pressure channel inoperable.	----------NOTE---------- One additional channel may be bypassed for up to 12 hours for surveillance testing. ----------	
	E.1 Place channel in bypass.	72 hours
	OR	
	E.2.1 Be in MODE 3.	78 hours
	AND	
	E.2.2 Be in MODE 4.	84 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One channel or train inoperable.	F.1 Restore channel or train to OPERABLE status. OR F.2.1 Be in MODE 3. AND F.2.2 Be in MODE 4.	48 hours 54 hours 60 hours
G. One train inoperable.	----------NOTE---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ---------- G.1 Restore train to OPERABLE status OR G.2.1 Be in MODE 3. AND G.2.2 Be in MODE 4.	 24 hours 30 hours 36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. Not Used.		
I. One channel inoperable.	----------NOTE---------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ---------- I.1 Place channel in trip. <u>OR</u> I.2 Be in MODE 3.	 72 hours 78 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
J. One or more Main Feedwater Pump trip channel(s) inoperable.	----------NOTE---------- One inoperable channel may be bypassed for up to 2 hours for surveillance testing of other channels. ----------	
	J.1 Place channel(s) in trip.	1 hour
	OR	
	J.2 Be in MODE 3.	7 hours
K. One channel inoperable.	----------NOTE---------- One additional channel may be tripped for up to 12 hours for surveillance testing. ----------	
	K.1 Place channel in bypass.	72 hours
	OR	
	K.2.1 Be in MODE 3.	78 hours
	AND	
	K.2.2 Be in MODE 5.	108 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
L. One or more required channel(s) inoperable.	L.1 Verify interlock is in required state for existing unit condition. OR L.2.1 Be in MODE 3. AND L.2.2 Be in MODE 4.	1 hour 7 hours 13 hours
M. One channel inoperable.	M.1 Place channel in trip. AND M.2 Restore channel to OPERABLE status.	1 hour During performance of next COT
N. One train inoperable.	----------NOTE---------- One train may be bypassed for up to 2 hours for surveillance testing provided the other train is OPERABLE. ---------- N.1 Be in MODE 3. AND N.2 Be in MODE 4.	 6 hours 12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
O. One or more channels inoperable.	O.1 Declare associated auxiliary feedwater pump(s) inoperable.	Immediately
P. One or both train(s) inoperable.	P.1 Restore train(s) to OPERABLE status. OR P.2.1 Be in MODE 3. AND P.2.2 Be in MODE 4.	48 hours 54 hours 60 hours

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.3	----------NOTE---------- The continuity check may be excluded. ---------- Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.4	Perform MASTER RELAY TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.5	Perform COT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.6	Perform SLAVE RELAY TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.7	----------NOTE---------- Verification of relay setpoints not required. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.8	----------NOTE---------- Verification of setpoint not required for manual initiation functions. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.9	----------NOTE---------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.10	----------NOTE---------- Not required to be performed for the turbine driven AFW pump until 24 hours after SG pressure is $\geq$ 900 psig. ---------- Verify ESF RESPONSE TIMES are within limits.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.11	----------NOTE---------- Verification of setpoint not required. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.12	Perform COT.	In accordance with the Surveillance Frequency Control Program

Table 3.3.2-1 (page 1 of 5)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE [a]
1.	Safety Injection					
a.	Manual Initiation	1,2,3,4	2	B	SR 3.3.2.8	NA
b.	Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c.	Containment Pressure - High 1	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 4.5 psig
d.	Pressurizer Pressure - Low	1,2,3[b]	4	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 1820 psig
e.	Steam Line Pressure Low	1,2,3[b]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 571 psig[c]
2.	Containment Spray					
a.	Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.8	NA
b.	Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c.	Containment Pressure High - 3	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 28.3 psig

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(b) Above the P-11 (Pressurizer Pressure) interlock and below P-11 unless the Function is blocked.
(c) Time constants used in the lead/lag controller are $t_1 \geq 50$ seconds and $t_2 \leq 5$ seconds.

Table 3.3.2-1 (page 2 of 5)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (a)
3.	Containment Isolation					
	a. Phase A Isolation					
	(1) Manual Initiation	1,2,3,4	2	B	SR 3.3.2.8	NA
	(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
	(3) Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
	b. Phase B Isolation					
	(1) Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.8	NA
	(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
	(3) Containment Pressure - High 3	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 28.3 psig
4.	Steam Line Isolation					
	a. Manual Initiation	1,2(i), 3(i)	2	F	SR 3.3.2.8	NA
	b. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2(i), 3(i)	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
	c. Automatic Actuation Logic (MSFIS)	1,2(l), 3(l)	2 trains	G	SR 3.3.2.6	NA
	d. Containment Pressure - High 2	1,2(i), 3(i)	3	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 18.3 psig

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(i) Except when all MSIVs are closed and de-activated; and all MSIV bypass valves are closed and de-activated, or closed and isolated by a closed manual valve, or isolated by two closed manual valves.
(l) Except when all MSIVs are closed and de-activated.

Table 3.3.2-1 (page 3 of 5)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (a)
4. Steam Line Isolation (continued)					
e. Steam Line Pressure					
(1) Low	1,2(i),3(b)(i)	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 571 psig(c)
(2) Negative Rate - High	3(g)(i)	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 125(h) psi
5. Turbine Trip and Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2(j),3(j)	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
b. Automatic Actuation Logic (MSFIS)	1,2(k),3(k)	2 trains	G	SR 3.3.2.6	NA
c. SG Water Level -High High (P-14)	1,2(j)	4 per SG	I	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 79.7% of Narrow Range Instrument Span
d. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(b) Above the P-11 (Pressurizer Pressure) Interlock and below P-11 unless the Function is blocked.
(c) Time constants used in the lead/lag controller are $t_1 \geq 50$ seconds and $t_2 \leq 5$ seconds.
(g) Below the P-11 (Pressurizer Pressure) Interlock; however, may be blocked below P-11 when safety injection on low steam line pressure is not blocked.
(h) Time constant utilized in the rate/lag controller is ≥ 50 seconds.
(i) Except when all MSIVs are closed and de-activated; and all MSIV bypass valves are closed and de-activated, or closed and isolated by a closed manual valve, or isolated by two closed manual valves.
(j) Except when all MFIVs are closed and de-activated; and all MFRVs are closed and de-activated or closed and isolated by a closed manual valve; and all MFRV bypass valves are closed and de-activated, or closed and isolated by a closed manual valve, or isolated by two closed manual valves.
(k) Except when all MFIVs are closed and de-activated.

Table 3.3.2-1 (page 4 of 5)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (a)
6.	Auxiliary Feedwater					
a.	Manual Initiation	1,2,3	1 per pump	O	SR 3.3.2.8	NA
b.	Automatic Actuation Logic and Actuation Relays (Solid State Protection System)	1,2,3	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c.	Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS)	1,2,3	2 trains	N	SR 3.3.2.3	NA
d.	SG Water Level Low - Low	1,2,3	4 per SG	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 22.3% of Narrow Range Instrument Span
e.	Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
f.	Loss of Offsite Power	1,2,3	2 trains	P	SR 3.3.2.7 SR 3.3.2.10	NA
g.	Trip of all Main Feedwater Pumps	1	2 per pump	J	SR 3.3.2.8	NA
h.	Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low	1,2,3	3	M	SR 3.3.2.1 SR 3.3.2.9 SR 3.3.2.10 SR 3.3.2.12	≥ 20.53 psia

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.

Table 3.3.2-1 (page 5 of 5)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE(a)
7. Automatic Switchover to Containment Sump					
a. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
b. Refueling Water Storage Tank (RWST) Level - Low Low	1,2,3,4	4	K	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 35.5% of instrument span
Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
8. ESFAS Interlocks					
a. Reactor Trip, P-4(m)	1,2,3	2 per train, 2 trains	F	SR 3.3.2.11	NA
b. Pressurizer Pressure, P-11	1,2,3	3	L	SR 3.3.2.5 SR 3.3.2.9	≤ 1979 psig

(a) The Allowable Value defines the Limiting Safety System Settings. See the Bases for the Trip Setpoints.

(m) The functions of the Reactor Trip, P-4 interlock required to meet the LCO are:
- Trips the main turbine – MODES 1 and 2
- Isolates MFW with coincident low T_{avg} – MODES 1 and 2
- Allows manual block of the automatic reactuation of SI after a manual reset of SI – MODES 1, 2, and 3
- Prevents opening of MFIVs if closed on SI or SG Water Level – High High – MODES 1, 2, and 3

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.8.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more Functions with two or more required channels inoperable.	C.1 Restore all but one channel to OPERABLE status.	7 days
D. Required Action and associated Completion Time of Condition C not met.	D.1 Enter the Condition referenced in Table 3.3.3-1 for the channel.	Immediately
E. As required by Required Action D.1 and referenced in Table 3.3.3-1.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	6 hours 12 hours
F. As required by Required Action D.1 and referenced in Table 3.3.3-1.	F.1 Initiate action in accordance with Specification 5.6.8.	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
SR 3.3.3.1 and SR 3.3.3.2 apply to each PAM instrumentation Function in Table 3.3.3-1.

SURVEILLANCE		FREQUENCY
SR 3.3.3.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	In accordance with the Surveillance Frequency Control Program
SR 3.3.3.2	----------NOTE---------- Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

Table 3.3.3-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

	FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION D.1
1.	Neutron Flux	2	E
2.	Reactor Coolant System (RCS) Hot Leg Temperature (Wide Range)	2	E
3.	RCS Cold Leg Temperature (Wide Range)	2	E
4.	RCS Pressure (Wide Range)	2	E
5.	Reactor Vessel Water Level	2	F
6.	Containment Normal Sump Water Level	2	E
7.	Containment Pressure (Normal Range)	2	E
8.	Steam Line Pressure	2 per steam generator	E
9.	Containment Radiation Level (High Range)	2	F
10.	Not Used		
11.	Pressurizer Water Level	2	E
12.	Steam Generator Water Level (Wide Range)	4	E
13.	Steam Generator Water Level (Narrow Range)	2 per steam generator	E
14.	Core Exit Temperature - Quadrant 1	2(a)	E
15.	Core Exit Temperature - Quadrant 2	2(a)	E
16.	Core Exit Temperature - Quadrant 3	2(a)	E
17.	Core Exit Temperature - Quadrant 4	2(a)	E
18.	Auxiliary Feedwater Flow Rate	4	E
19.	Refueling Water Storage Tank Level	2	E

(a) A channel consists of two core exit thermocouples (CETs).

3.3 INSTRUMENTATION

3.3.4 Remote Shutdown System

LCO 3.3.4 The Remote Shutdown System Functions in Table 3.3.4-1 and the required auxiliary shutdown panel (ASP) controls shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function and required ASP control.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required Functions inoperable. OR One or more required ASP controls inoperable.	A.1 Restore required Function and required ASP controls to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.4.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.2	Verify each required auxiliary shutdown panel control circuit and transfer switch is capable of performing the intended function.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.3	----------NOTES---------- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. Reactor Trip Breakers and RCP breakers are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION for each required instrumentation channel.	In accordance with the Surveillance Frequency Control Program

Table 3.3.4-1 (page 1 of 1)
Remote Shutdown System Functions

FUNCTION	REQUIRED CHANNELS
1. Source Range Neutron Flux[a]	1
2. Reactor Trip Breaker Position	1 per trip breaker
3. Pressurizer Pressure	1
4. RCS Wide Range Pressure	1
5. RCS Hot Leg Temperature	1
6. RCS Cold Leg Temperature	1
7. SG Pressure	1 per SG
8. SG Level	1 per SG
9. AFW Flow Rate	1
10. RCP Breakers	1 per pump
11. AFW Suction Pressure	1
12. Pressurizer Level	1

a. Not required OPERABLE in MODE 1 or in MODE 2 above the P-6 setpoint.

3.3 INSTRUMENTATION

3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

LCO 3.3.5 Four channels per 4-kV NB bus of the loss of voltage Function and four channels per 4-kV NB bus of the degraded voltage Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel per bus inoperable.	----------NOTE---------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. ---------- A.1 Place channel in trip.	6 hours
B. One or more Functions with two or more channels per bus inoperable. <u>OR</u> Required Action and associated Completion Time of Condition A not met.	B.1 Declare associated load shedder and emergency load sequencer (LSELS) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	Not Used.	
SR 3.3.5.2	----------NOTE---------- Verification of time delays is not required. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3	Perform CHANNEL CALIBRATION with nominal Trip Setpoint and Allowable Value as follows: a. Loss of voltage Allowable Value ≥ 90.0V, 120V bus with a time delay of 1.0 + 0.15, -0.1 sec. Loss of voltage nominal Trip Setpoint 91.28V, 120V bus with a time delay of 1.0 sec. b. Degraded voltage Allowable Value ≥ 107.5V, 120V bus. 1. Accident time delay (SIS) 8.0 + 0.5, -0.6 sec. 2. Non-accident time delay (No SIS) 56 +8.5, -7.6 sec. Degraded voltage nominal Trip Setpoint 108.46V, 120V bus.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.4	Verify LOP DG Start ESF RESPONSE TIMES are within limits.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.6 Containment Purge Isolation Instrumentation

LCO 3.3.6 The Containment Purge Isolation instrumentation for each Function in Table 3.3.6-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.6-1.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Only applicable in MODE 1, 2, 3, or 4. ---------- One or more Functions with one or more channels or trains inoperable.	A.1 Place and maintain containment purge supply and exhaust valves in closed position.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ----------NOTE---------- Only applicable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. ---------- One or more Functions with one or more channels or trains inoperable.	B.1 Place and maintain containment purge supply and exhaust valves in closed position. OR B.2 Enter applicable Conditions and Required Actions of LCO 3.9.4, "Containment Penetrations," for containment purge supply and exhaust valves made inoperable by isolation instrumentation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.6-1 to determine which SRs apply for each Containment Purge Isolation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.6.2	----------NOTE---------- The continuity check may be excluded. ---------- Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.3	Perform COT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.4	----------NOTE---------- Verification of setpoint is not required. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.5	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.6	Verify Containment Purge Isolation ESF RESPONSE TIMES are within limits.	In accordance with the Surveillance Frequency Control Program

Table 3.3.6-1 (page 1 of 1)
Containment Purge Isolation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1.	Manual Initiation	1,2,3,4, (a),(b)	2	SR 3.3.6.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1,2,3,4, (a),(b)	2 trains	SR 3.3.6.2 SR 3.3.6.6	NA
3.	Containment Atmosphere - Gaseous Radioactivity	1,2,3,4, (a),(b)	1	SR 3.3.6.1 SR 3.3.6.3 SR 3.3.6.5	(c)
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			

(a) During CORE ALTERATIONS.
(b) During movement of irradiated fuel assemblies within containment.
(c) Trip setpoint concentration value ($\mu Ci/cm^3$) is to be established such that the actual submersion rate would not exceed 9 mR/h in the containment building.

3.3 INSTRUMENTATION

3.3.7 Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation

LCO 3.3.7 The CREVS actuation instrumentation for each Function in Table 3.3.7-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.7-1.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel or train inoperable.	A.1 Place one CREVS train in Control Room Ventilation Isolation Signal (CRVIS) mode.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ----------NOTE---------- Not applicable to Function 3. ---------- One or more Functions with two channels or two trains inoperable.	B.1.1 Place one CREVS train in the CRVIS mode. AND B.1.2 Enter applicable Conditions and Required Actions of LCO 3.7.10, “Control Room Emergency Ventilation System (CREVS),” for one CREVS train made inoperable by inoperable CREVS actuation instrumentation. OR B.2 Place both trains in CRVIS mode.	Immediately Immediately Immediately
C. Both radiation monitoring channels inoperable.	C.1.1 Enter applicable Conditions and Required Actions of LCO 3.7.10, “Control Room Emergency Ventilation System (CREVS),” for one CREVS train made inoperable by inoperable CREVS actuation instrumentation. AND C.1.2 Place one CREVS train in CRVIS mode. OR C.2 Place both trains in CRVIS mode.	Immediately 1 hour 1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action and associated Completion Time for Condition A, B or C not met in MODE 1, 2, 3, or 4.	D .1	Be in MODE 3.	6 hours
	AND		
	D .2	Be in MODE 5.	36 hours
E. Required Action and associated Completion Time for Condition A, B or C not met during movement of irradiated fuel assemblies or during CORE ALTERATIONS.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E .2	Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.7-1 to determine which SRs apply for each CREVS Actuation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.7.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.2	Perform COT.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.7.3	----------NOTE---------- The continuity check may be excluded. ----------	
	Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.4	----------NOTE---------- Verification of setpoint is not required. ----------	
	Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.5	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.6	----------NOTE---------- Radiation monitor detectors are excluded from response time testing. ----------	
	Verify Control Room Ventilation Isolation ESF RESPONSE TIMES are within limits.	In accordance with the Surveillance Frequency Control Program

Table 3.3.7-1 (page 1 of 1)
CREVS Actuation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1.	Manual Initiation	1, 2, 3, 4, (a) and (c)	2	SR 3.3.7.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1, 2, 3, 4, (a) and (c)	2 trains	SR 3.3.7.3 SR 3.3.7.6	NA
3.	Control Room Radiation-Control Room Air Intakes	1, 2, 3, 4, (a) and (c)	2	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.5 SR 3.3.7.6	(b)
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			

(a) During movement of irradiated fuel assemblies.
(b) Trip Setpoint concentration value ($\mu Ci/cm^3$) is to be established such that the actual submersion dose rate would not exceed 2 mR/hr in the control room.
(c) During CORE ALTERATIONS.

3.3 INSTRUMENTATION

3.3.8 Emergency Exhaust System (EES) Actuation Instrumentation

LCO 3.3.8 The EES actuation instrumentation for each Function in Table 3.3.8-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.8-1.

ACTIONS

----------NOTES----------
1. LCO 3.0.3 is not applicable.

2. Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel or train inoperable.	A.1 Place one EES train in the Fuel Building Ventilation Isolation Signal (FBVIS) mode.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ----------NOTE---------- Not applicable to Function 3. ---------- One or more Functions with two channels or two trains inoperable.	B.1.1 Place one EES train in the FBVIS mode. AND B.1.2 Enter applicable Conditions and Required Actions of LCO 3.7.13, “Emergency Exhaust System (EES),” for one EES train made inoperable by inoperable EES actuation instrumentation. OR B.2 Place both trains in the FBVIS mode.	Immediately Immediately Immediately
C. Both radiation monitoring channels inoperable.	C.1.1 Enter the applicable Conditions and Required Actions of LCO 3.7.13, “Emergency Exhaust System (EES),” for one EES train made inoperable by inoperable EES actuation instrumentation. AND C.1.2 Place one EES train in the FBVIS mode. OR C.2 Place both EES trains in the FBVIS mode.	Immediately 1 hour 1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time for Condition A, B or C not met during movement of irradiated fuel assemblies in the fuel building.	D.1 Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.8-1 to determine which SRs apply for each EES Actuation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.2	Perform COT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.3	----------NOTE---------- The continuity check may be excluded. --- Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.8.4	----------NOTE---------- Verification of setpoint is not required. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.5	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

Table 3.3.8-1 (page 1 of 1)
EES Actuation Instrumentation

	FUNCTION	APPLICABLE MODES OR SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1.	Manual Initiation	(a)	2	SR 3.3.8.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	(a)	2 trains	SR 3.3.8.3	NA
3.	Fuel Building Exhaust Radiation - Gaseous	(a)	2	SR 3.3.8.1 SR 3.3.8.2 SR 3.3.8.5	(b)

(a) During movement of irradiated fuel assemblies in the fuel building.
(b) Trip Setpoint concentration value ($\mu Ci/cm^3$) is to be established such that the actual submersion dose rate would not exceed 4 mR/hr in the fuel building.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2 ----------NOTE---------- THERMAL POWER does not have to be reduced to comply with this Required Action. ----------	
	Perform SR 3.4.1.3.	Prior to THERMAL POWER exceeding 50% RTP AND Prior to THERMAL POWER exceeding 75% RTP AND 24 hours after THERMAL POWER reaching ≥ 95% RTP
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	Verify pressurizer pressure is greater than or equal to the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.1.2	Verify RCS average temperature is less than or equal to the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.4.1.3	Verify RCS total flow rate is ≥ 361,200 gpm and greater than or equal to the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.4.1.4	----------NOTE---------- Not required to be performed until 7 days after ≥ 95% RTP. ----------	
	Verify by precision heat balance that RCS total flow rate is ≥ 361,200 gpm and greater than or equal to the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 RCS Minimum Temperature for Criticality

LCO 3.4.2 Each RCS operating loop average temperature (T_{avg}) shall be $\geq$ 551°F.

APPLICABILITY: MODE 1,
MODE 2 with $k_{eff} \geq 1.0$.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. T_{avg} in one or more operating RCS loops not within limit.	A.1 Be in MODE 2 with $k_{eff} < 1.0$.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.2.1	Verify RCS T_{avg} in each operating loop $\geq$ 551°F.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. ----------NOTE---------- Required Action C.2 shall be completed whenever this Condition is entered. ---------- Requirements of LCO not met any time in other than MODE 1, 2, 3, or 4.	C.1 Initiate action to restore parameter(s) to within limits. AND C.2 Determine RCS is acceptable for continued operation.	Immediately Prior to entering MODE 4

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	----------NOTE---------- Only required to be performed during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing. ---------- Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates are within the limits specified in the PTLR.	In accordance with the Surveillance Frequency Control Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops - MODES 1 and 2

LCO 3.4.4 Four RCS loops shall be OPERABLE and in operation.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of LCO not met.	A.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.4.1 Verify each RCS loop is in operation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify required RCS loops are in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.5.2	Verify steam generator secondary side narrow range water levels are $\geq$ 6% for required RCS loops.	In accordance with the Surveillance Frequency Control Program
SR 3.4.5.3	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2	----------NOTE---------- Only required if one RHR loop is OPERABLE. ---------- Be in MODE 5.	 24 hours
B. Required loops inoperable. OR No RCS or RHR loop in operation.	B.1	Suspend operations that would cause introduction into the RCS, coolant with boron concentration less than required to meet SDM of LCO 3.1.1.	Immediately
	AND		
	B.2	Initiate action to restore one loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify one RHR or RCS loop is in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.6.2	Verify SG secondary side narrow range water levels are $\geq$ 6% for required RCS loops.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.6.3	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.6.4	----------NOTE---------- Not required to be performed until 12 hours after entering MODE 4. ----------	
	Verify required RHR loop locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHR loop inoperable. AND Required SGs secondary side water levels not within limits.	A.1 Initiate action to restore a second RHR loop to OPERABLE status. OR A.2 Initiate action to restore required SG secondary side water levels to within limits.	Immediately Immediately
B. Required RHR loops inoperable. OR No RHR loop in operation.	B.1 Suspend operations that would cause introduction into the RCS, coolant with boron concentration less than required to meet SDM of LCO 3.1.1. AND B.2 Initiate action to restore one RHR loop to OPERABLE status and operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify one RHR loop is in operation.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.7.2	Verify SG secondary side wide range water level is $\geq$ 66% in required SGs.	In accordance with the Surveillance Frequency Control Program
SR 3.4.7.3	Verify correct breaker alignment and indicated power are available to the required RHR pump that is not in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.7.4	Verify required RHR loop locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required RHR loops inoperable. OR No RHR loop in operation	B.1 Suspend operations that would cause introduction into the RCS, coolant with boron concentration less than required to meet the SDM of LCO 3.1.1. AND B.2 Initiate action to restore one RHR loop to OPERABLE status and operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one RHR loop is in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.8.2	Verify correct breaker alignment and indicated power are available to the required RHR pump that is not in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.8.3	Verify RHR loop locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One required group of pressurizer heaters inoperable.	B.1 Restore required group of pressurizer heaters to OPERABLE status.	72 hours
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify pressurizer water level is $\leq$ 92%.	In accordance with the Surveillance Frequency Control Program
SR 3.4.9.2	Verify capacity of each required group of pressurizer heaters is $\geq$ 150 kW.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. More than one block valve inoperable.	----------NOTE---------- Required Actions do not apply when block valve is inoperable solely as a result of complying with Required Actions B.2 or E.2. ---------- F.1 Place associated PORVs in manual control. <u>AND</u> F.2 Restore one block valve to OPERABLE status.	 1 hour 2 hours
G. Required Action and associated Completion Time of Condition F not met.	G.1 Be in MODE 3. <u>AND</u> G.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	----------NOTE---------- Not required to be performed with block valve closed in accordance with the Required Actions of this LCO. ---------- Perform a complete cycle of each block valve.	In accordance with the Surveillance Frequency Control Program
SR 3.4.11.2	Perform a complete cycle of each PORV.	In accordance with the Inservice Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Verify a maximum of zero safety injection pumps are capable of injecting into the RCS.	In accordance with the Surveillance Frequency Control Program
SR 3.4.12.2	Verify a maximum of one ECCS centrifugal charging pump and the normal charging pump capable of injecting into the RCS.	In accordance with the Surveillance Frequency Control Program
SR 3.4.12.3	Verify each accumulator is isolated when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.	In accordance with the Surveillance Frequency Control Program
SR 3.4.12.4	Verify RHR suction isolation valves are open for each required RHR suction relief valve.	In accordance with the Surveillance Frequency Control Program
SR 3.4.12.5	Verify required RCS vent $\geq$ 2.0 square inches open.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.6	Verify PORV block valve is open for each required PORV.	In accordance with the Surveillance Frequency Control Program
SR 3.4.12.7	Not Used.	
SR 3.4.12.8	----------NOTE---------- Not required to be performed until 12 hours after decreasing any RCS cold leg temperature to $\leq$ 368°F. ---------- Perform a COT on each required PORV, excluding actuation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.12.9	Perform CHANNEL CALIBRATION for each required PORV actuation channel.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.13.1	----------NOTES---------- 1. Not required to be performed until 12 hours after establishment of steady state operation. 2. Not applicable to primary to secondary LEAKAGE. --- Verify RCS operational LEAKAGE is within limits by performance of RCS water inventory balance.	In accordance with the Surveillance Frequency Control Program
SR 3.4.13.2	----------NOTE---------- Not required to be performed until 12 hours after establishment of steady state operation. --- Verify primary to secondary LEAKAGE is $\leq$ 150 gallons per day through any one SG.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.14.1	----------NOTES---------- 1. Not required to be performed in MODES 3 and 4. 2. Not required to be performed on the RCS PIVs located in the RHR flow path when in the shutdown cooling mode of operation. 3. RCS PIVs actuated during the performance of this Surveillance are not required to be tested more than once if a repetitive testing loop cannot be avoided. ----------	
	Verify leakage from each RCS PIV is equivalent to $\leq$ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm at an RCS pressure $\geq$ 2215 psig and $\leq$ 2255 psig.	In accordance with the Surveillance Frequency Control Program AND Prior to entering MODE 2 whenever the unit has been in MODE 5 for 7 days or more, and if leakage testing has not been performed in the previous 9 months AND Within 24 hours following check valve actuation due to flow through the valve

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.14.2	Verify RHR suction isolation valve interlock prevents the valves from being opened with a simulated or actual RCS pressure signal $\geq$ 425 psig except when the valves are open to satisfy LCO 3.4.12.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere particulate radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.2	Perform COT of the required containment atmosphere particulate radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the required containment sump level and flow monitoring system.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere particulate radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.5	Perform CHANNEL CALIBRATION of the required containment cooler condensate monitoring system.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	----------NOTE---------- Only required to be performed in MODE 1. ----------	
	Verify reactor coolant DOSE EQUIVALENT XE-133 specific activity $\leq$ 500 μCi/gm.	In accordance with the Surveillance Frequency Control Program
SR 3.4.16.2	----------NOTE---------- Only required to be performed in MODE 1. ----------	
	Verify reactor coolant DOSE EQUIVALENT I-131 specific activity $\leq$ 1.0 μCi/gm.	In accordance with the Surveillance Frequency Control Program AND Between 2 and 6 hours after a THERMAL POWER change of $\geq$ 15% RTP within a 1 hour period

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each accumulator isolation valve is fully open.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.2	Verify borated water volume in each accumulator is $\geq$ 6122 gallons and $\leq$ 6594 gallons.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.3	Verify nitrogen cover pressure in each accumulator is $\geq$ 585 psig and $\leq$ 665 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.4	Verify boron concentration in each accumulator is $\geq$ 2300 ppm and $\leq$ 2500 ppm.	In accordance with the Surveillance Frequency Control Program AND ---------NOTE------- Only required to be performed for affected accumulators ---------- Once within 6 hours after each solution volume increase of $\geq$ 70 gallons that is not the result of addition from the refueling water storage tank

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.5	Verify power is removed from each accumulator isolation valve operator when RCS pressure is > 1000 psig.	In accordance with the Surveillance Frequency Control Program

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ECCS - Operating

LCO 3.5.2 Two ECCS trains shall be OPERABLE.

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

1. In MODE 3, both safety injection (SI) pump flow paths may be isolated by closing the isolation valves for up to 2 hours to perform pressure isolation valve testing per SR 3.4.14.1.

2. Operation in MODE 3 with ECCS pumps made incapable of injecting pursuant to LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," is allowed for up to 4 hours or until the temperature of all RCS cold legs exceeds 375°F, whichever comes first.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more trains inoperable.	A.1 Restore train(s) to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours
C. Less than 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	C.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify the following valves are in the listed position with power to the valve operator removed. Number / Position / Function BN HV-8813 / Open / Safety Injection to RWST Isolation Valve EM HV-8802A / Closed / SI Hot Legs 2 & 3 Isolation Valve EM HV-8802B / Closed / SI Hot Legs 1 & 4 Isolation Valve EM HV-8835 / Open / Safety Injection Cold Leg Isolation Valve EJ HV-8840 / Closed / RHR/SI Hot Leg Recirc Isolation Valve EJ HV-8809A / Open / RHR to Accum Inject Loops 1 & 2 Isolation Valve EJ HV-8809B / Open / RHR to Accum Inject Loops 3 & 4 Isolation Valve	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.2	----------NOTE---------- Not required to be met for system vent flow paths opened under administrative control. ---------- Verify each ECCS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.3	Verify ECCS locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.4	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.5	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.6	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.7	Verify, for each ECCS throttle valve listed below, each mechanical position stop is in the correct position. Valve Number EM-V0095 EM-V0107 EM-V0089 EM-V0096 EM-V0108 EM-V0090 EM-V0097 EM-V0109 EM-V0091 EM-V0098 EM-V0110 EM-V0092	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.8	Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and the suction inlet strainers show no evidence of structural distress or abnormal corrosion.	In accordance with the Surveillance Frequency Control Program

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.3 ECCS -Shutdown

LCO 3.5.3 One ECCS train shall be OPERABLE.

----------NOTE----------
An RHR subsystem may be considered OPERABLE during alignment and operation for decay heat removal, if capable of being manually realigned to the ECCS mode of operation.

APPLICABILITY: MODE 4.

ACTIONS

----------NOTE----------
LCO 3.0.4b. is not applicable to ECCS centrifugal charging pump subsystem.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required ECCS residual heat removal (RHR) subsystem inoperable.	A.1 Initiate action to restore required ECCS RHR subsystem to OPERABLE status.	Immediately
B. Required ECCS centrifugal charging pump (CCP) subsystem inoperable.	B.1 Restore required ECCS CCP subsystem to OPERABLE status.	1 hour
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 5.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	The following SRs are applicable for all equipment required to be OPERABLE: SR 3.5.2.1 SR 3.5.2.7 SR 3.5.2.3 SR 3.5.2.8 SR 3.5.2.4	In accordance with applicable SRs

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 Refueling Water Storage Tank (RWST)

LCO 3.5.4 The RWST shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RWST boron concentration not within limits. OR RWST borated water temperature not within limits.	A.1 Restore RWST to OPERABLE status.	8 hours
B. RWST inoperable for reasons other than Condition A.	B.1 Restore RWST to OPERABLE status.	1 hour
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.4.1	----------NOTE---------- Only required to be performed when ambient air temperature is < 37°F or > 100°F. ---------- Verify RWST borated water temperature is ≥ 37°F and ≤ 100°F.	In accordance with the Surveillance Frequency Control Program
SR 3.5.4.2	Verify RWST borated water volume is ≥ 394,000 gallons.	In accordance with the Surveillance Frequency Control Program
SR 3.5.4.3	Verify RWST boron concentration is ≥ 2400 ppm and ≤ 2500 ppm.	In accordance with the Surveillance Frequency Control Program

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.5 Seal Injection Flow

LCO 3.5.5 Reactor coolant pump seal injection flow to each RCP seal shall be within the limits of Figure 3.5.5-1.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Seal injection flow not within limit.	A.1 Adjust manual seal injection throttle valves to give a flow within the limits of Figure 3.5.5-1.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.5.1	----------NOTE---------- Not required to be performed until 4 hours after the Reactor Coolant System pressure stabilizes at $\geq$ 2215 psig and $\leq$ 2255 psig. ---------- Verify manual seal injection throttle valves are adjusted to give a flow within the limits of Figure 3.5.5-1.	In accordance with the Surveillance Frequency Control Program

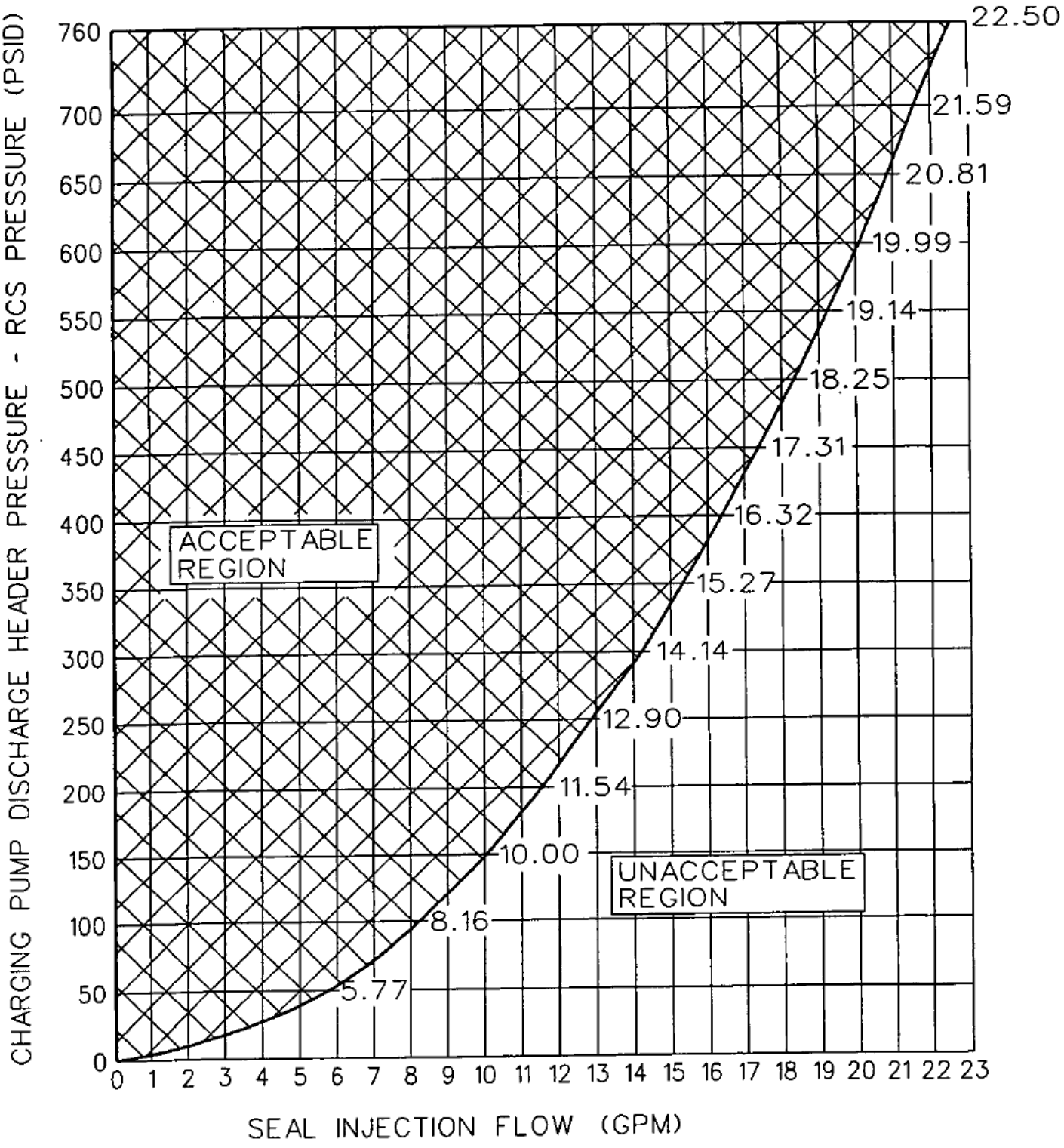

Figure 3.5.5-1 (page 1 of 1)
Seal Injection Flow Limits

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.1	----------NOTES---------- 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1. ---------- Perform required air lock leakage rate testing in accordance with the Containment Leakage Rate Testing Program.	In accordance with the Containment Leakage Rate Testing Program
SR 3.6.2.2	Verify only one door in the air lock can be opened at a time.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. (continued)	D.3	Perform SR 3.6.3.6 or SR 3.6.3.7 for the resilient seal purge valves closed to comply with Required Action D.1.	Once per 92 days
E. Required Action and associated Completion Time not met.	E.1 AND E.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1	Verify each containment shutdown purge valve is sealed closed except for one purge valve in a penetration flow path while in Condition D of this LCO.	In accordance with the Surveillance Frequency Control Program AND Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.2	Verify each containment mini-purge valve is closed, except when the containment mini-purge valves are open for pressure control, ALARA or air quality considerations for personnel entry, or for Surveillances that require the valves to be open.	In accordance with the Surveillance Frequency Control Program
SR 3.6.3.3	----------NOTE---------- Valves and blind flanges in high radiation areas may be verified by use of administrative controls. ----------	
	Verify each containment isolation manual valve and blind flange that is located outside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	In accordance with the Surveillance Frequency Control Program
SR 3.6.3.4	----------NOTE---------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. ----------	
	Verify each containment isolation manual valve and blind flange that is located inside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days
SR 3.6.3.5	Verify the isolation time of each automatic power operated containment isolation valve is within limits.	In accordance with the Inservice Testing Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.6	----------NOTE---------- Only required to be performed when containment shutdown purge valve blind flanges are installed. ----------	
	Perform leakage rate testing for containment shutdown purge valves with resilient seals and associated blind flanges.	In accordance with the Surveillance Frequency Control Program AND Following each reinstallation of the blind flange
SR 3.6.3.7	----------NOTE---------- Only required to be performed for the containment shutdown purge valves when associated blind flanges are removed. ----------	
	Perform leakage rate testing for containment mini-purge and shutdown purge valves with resilient seals.	In accordance with the Surveillance Frequency Control Program AND Within 92 days after opening the valve
SR 3.6.3.8	Verify each automatic containment isolation valve that is not locked, sealed or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

3.6 CONTAINMENT SYSTEMS

3.6.4 Containment Pressure

LCO 3.6.4 Containment pressure shall be ≥ -0.3 psig and ≤ + 1.5 psig.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment pressure not within limits.	A.1 Restore containment pressure to within limits.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1	Verify containment pressure is within limits.	In accordance with the Surveillance Frequency Control Program

3.6 CONTAINMENT SYSTEMS

3.6.5 Containment Air Temperature

LCO 3.6.5 Containment average air temperature shall be ≤ 120°F.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment average air temperature not within limit.	A.1 Restore containment average air temperature to within limit.	8 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.5.1	Verify containment average air temperature is within limit.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two containment cooling trains inoperable.	D.1 Restore one containment cooling train to OPERABLE status.	72 hours
E. Required Action and associated Completion Time of Condition C or D not met.	E.1 Be in MODE 3. AND E.2 Be in MODE 5.	6 hours 36 hours
F. Two containment spray trains inoperable. OR Any combination of three or more trains inoperable.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	----------NOTE---------- Not required to be met for system vent flow paths opened under administrative control. ----------	
	Verify each containment spray manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6.2	Operate each containment cooling train fan unit for ≥ 15 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.6.6.3	Not Used.	
SR 3.6.6.4	Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.6.6.5	Verify each automatic containment spray valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.6.6	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.6.7	Verify each containment cooling train starts automatically and minimum cooling water flow rate is established on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.6.8	Verify each spray nozzle is unobstructed.	Following maintenance which could result in nozzle blockage

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6.9	Verify containment spray locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program

3.6 CONTAINMENT SYSTEMS

3.6.7 Spray Additive System

LCO 3.6.7 The Spray Additive System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spray Additive System inoperable.	A.1 Restore Spray Additive System to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7.1	Verify each spray additive manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.7.2	Verify spray additive tank solution volume is $\geq$ 4340 gal and $\leq$ 4540 gal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.7.3	Verify spray additive tank solution concentration is $\geq$ 28% and $\leq$ 31% by weight.	In accordance with the Surveillance Frequency Control Program
SR 3.6.7.4	Verify each spray additive automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.7.5	Verify spray additive flow rate from each solution's flow path.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. ----------NOTE---------- Separate Condition entry is allowed for each MSIV. ---------- One or more MSIV inoperable in MODE 2 or 3.	I.1 Close MSIV. AND I.2 Verify MSIV is closed.	8 hours Once per 7 days
J. Required Action and associated Completion Time of Condition H or I not met.	J.1 Be in MODE 3. AND J.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	----------NOTE---------- Only required to be performed in MODES 1 and 2. ---------- Verify the isolation time of each MSIV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.2.2	----------NOTE---------- Only required to be performed in MODES 1 and 2. ---------- Verify each actuator train actuates the MSIV to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.2.3	Verify each MSIV bypass valve actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.2.4	Verify isolation time of each MSIV bypass valve is within limit.	In accordance with the Inservice Testing Program

SURVEILLANCE REQUIRMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.3.2	----------NOTE---------- Only required to be performed in MODES 1 and 2. ---------- Verify each actuator train actuates the MFIV to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.3.3	----------NOTE---------- Only required to be performed in MODES 1 and 2. ---------- Verify each MFRV and MFRV bypass valve actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. With one or more of the ARVs inoperable because of excessive seat leakage.	D.1 Initiate action to close the associated block valve(s). AND D.2 Restore ARV(s) to OPERABLE staus.	Immediately 30 days
E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify one complete cycle of each ARV.	In accordance with the Inservice Testing Program
SR 3.7.4.2	Verify one complete cycle of each ARV block valve.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time for Condition A, B, or C not met. OR Two AFW trains inoperable.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	6 hours 12 hours
E. Three AFW trains inoperable.	E.1 ----------NOTE---------- LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status. ---------- Initiate action to restore one AFW train to OPERABLE status.	 Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	----------NOTE---------- Not required to be performed for the AFW flow control valves until the system is placed in standby or THERMAL POWER is > 10% RTP. ---------- Verify each AFW manual, power operated, and automatic valve in each water flow path, and in both steam supply flow paths to the steam turbine driven pump, that is not locked, sealed, or otherwise secured in position, is in the correct position.	 In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.5.2	----------NOTE---------- Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 900 psig in the steam generator. ---------- Verify the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Test Program
SR 3.7.5.3	Verify each AFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.5.4	----------NOTE---------- Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 900 psig in the steam generator. ---------- Verify each AFW pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.5.5	Verify proper alignment of the required AFW flow paths by verifying flow from the condensate storage tank to each steam generator.	Prior to entering MODE 2 whenever unit has been in MODE 5 or 6 for > 30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the CST contained water volume is $\geq$ 281,000 gal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	----------NOTE---------- Isolation of CCW flow to individual components does not render the CCW System inoperable. ---------- Verify each CCW manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.7.7.2	Verify each CCW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.7.3	Verify each CCW pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	----------NOTE---------- Isolation of ESW System flow to individual components does not render the ESW System inoperable. ---------- Verify each ESW manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.2	Verify each ESW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.3	Verify each ESW pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Verify water level of UHS is $\geq$ 1070 ft mean sea level.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.2	Verify plant inlet water temperature of UHS is $\leq$ 90°F.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Two CREVS trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Operate each CREVS train pressurization filter unit for ≥ 15 continuous minutes with the heaters operating and each CREVS train filtration filter unit for ≥ 15 continuous minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.7.10.2	Perform required CREVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.10.3	Verify each CREVS train actuates on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.10.4	Perform required unfiltered air inleakage testing of the CRE and CBE boundaries in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Habitability Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify each CRACS train has the capability to remove the assumed heat load.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two EES trains inoperable for reasons other than Condition B during movement of irradiated fuel assemblies in the fuel building.	E.1 Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.1	Operate each EES train for ≥ 15 continuous minutes with the heaters operating.	In accordance with the Surveillance Frequency Control Program
SR 3.7.13.2	Perform required EES filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.13.3	Verify each EES train actuates on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.13.4	Verify one EES train can maintain a negative pressure $\geq$ 0.25 inches water gauge with respect to atmospheric pressure in the auxiliary building during the SIS mode of operation.	In accordance with the Surveillance Frequency Control Program
SR 3.7.13.5	Verify one EES train can maintain a negative pressure $\geq$ 0.25 inches water gauge with respect to atmospheric pressure in the fuel building during the FBVIS mode of operation.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.15 Fuel Storage Pool Water Level

LCO 3.7.15 The fuel storage pool water level shall be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: During movement of irradiated fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel storage pool water level not within limit.	A.1 ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- Suspend movement of irradiated fuel assemblies in the fuel storage pool.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.15.1	Verify the fuel storage pool water level is ≥ 23 ft above the top of the irradiated fuel assemblies seated in the storage racks.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the fuel storage pool boron concentration is within limit.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.18 Secondary Specific Activity

LCO 3.7.18 The specific activity of the secondary coolant shall be $\leq$ 0.10 μCi/gm DOSE EQUIVALENT I-131.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Specific activity not within limit.	A.1 Be in MODE 3. AND A.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.18.1	Verify the specific activity of the secondary coolant is $\leq$ 0.10 μCi/gm DOSE EQUIVALENT I-131.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.19.1	Verify each automatic SSIV in the flow path is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.7.19.2	Verify the isolation time of each automatic SSIV is within limit.	In accordance with the Inservice Testing Program
SR 3.7.19.3	Verify each automatic SSIV in the flow path actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.20.1	Verify each Class 1E electrical equipment A/C train actuates on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.20.2	Verify each Class 1E electrical equipment A/C train has the capability to remove the assumed heat load.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.2	----------NOTES---------- 1. Performance of SR 3.8.1.7 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met. ---------- Verify each DG starts from standby conditions and achieves steady state voltage $\geq$ 3950 V and $\leq$ 4320 V, and frequency $\geq$ 59.4 Hz and $\leq$ 60.6 Hz.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.3	----------NOTES---------- 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow without shutdown a successful performance of SR 3.8.1.2 or SR 3.8.1.7. ---------- Verify each DG is synchronized and loaded and operates for $\geq$ 60 minutes at a load $\geq$ 5650 kW and $\leq$ 6201 kW.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.4	Verify each fuel oil transfer pump starts on low level in the associated day tank standpipe.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.5	Check for and remove accumulated water from each day tank.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.6	Verify each fuel oil transfer system operates to transfer fuel oil from the storage tank to the day tank.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	----------NOTE---------- All DG starts may be preceded by an engine prelube period. ---------- Verify each DG starts from standby condition and achieves: a. In ≤ 12 seconds, voltage ≥ 3950 V and frequency ≥ 59.4 Hz; and b. Steady state voltage ≥ 3950 V and ≤ 4320 V, and frequency ≥ 59.4 Hz and ≤ 60.6 Hz.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.8	Not Used.	
SR 3.8.1.9	Not Used.	
SR 3.8.1.10	----------NOTE---------- If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition, the power factor shall be maintained as close to the limit as practicable. ---------- Verify each DG does not trip and voltage is maintained ≤ 4992 V and frequency is maintained ≤ 65.4 Hz during and following a load rejection of ≥ 5650 kW and ≤ 6201 kW.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ----------	
	Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 12 seconds, 2. energizes auto-connected shutdown loads through the shutdown sequencer, 3. maintains steady state voltage ≥ 3950 V and ≤ 4320 V, 4. maintains steady state frequency ≥ 59.4 Hz and ≤ 60.6 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	----------NOTES---------- 1. All DG starts may be preceded by a prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. --- Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each DG auto-starts from standby condition and: a. In ≤ 12 seconds after auto-start and during tests, achieves voltage ≥ 3950 V and frequency ≥ 59.4 Hz; b. Achieves steady state voltage ≥ 3950 V and ≤ 4320 V, and frequency ≥ 59.4 Hz and ≤ 60.6 Hz; c. Operates for ≥ 5 minutes; d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are auto-connected and energized through the LOCA sequencer from the offsite power system.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	Verify each DG's automatic trips are bypassed on actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated ESF actuation signal except: a. Engine overspeed; b. Generator differential current; c. Low lube oil pressure; d. High crankcase pressure; e. Start failure relay; and f. High jacket coolant temperature.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.14	----------NOTES---------- 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition, the power factor shall be maintained as close to the limit as practicable. ---------- Verify each DG operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 6300 kW and ≤ 6821 kW; and b. For the remaining hours of the test loaded ≥ 5650 kW and ≤ 6201 kW.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.15	----------NOTES---------- 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 5650 kW and ≤ 6201 kW. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. ---------- Verify each DG starts and achieves: a. In ≤ 12 seconds, voltage ≥ 3950 V and frequency ≥ 59.4 Hz; and b. Steady state voltage ≥ 3950 V and ≤ 4320 V, and frequency ≥ 59.4 Hz and ≤ 60.6 Hz.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.16	----------NOTE---------- This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.17	----------NOTE---------- This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify, with a DG operating in test mode and connected to its bus, an actual or simulated Safety Injection signal overrides the test mode by: a. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency load from offsite power.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENT (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.18	----------NOTE---------- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify interval between each sequenced load block is within ± 10% of design interval for each LOCA and shutdown sequence timer.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.19	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ----------	
	Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated Safety Injection signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 12 seconds, 2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady state voltage ≥ 3950 V and ≤ 4320 V, 4. achieves steady state frequency ≥ 59.4 Hz and ≤ 60.6 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.20	----------NOTE---------- All DG starts may be preceded by an engine prelube period. ---------- Verify when started simultaneously from standby condition, each DG achieves: a. In ≤ 12 seconds, voltage ≥ 3950 V and frequency ≥ 59.4 Hz; and b. Steady state voltage ≥ 3950 V and ≤ 4320 V, and frequency ≥ 59.4 Hz and ≤ 60.6 Hz.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.21	----------NOTE---------- The continuity check may be excluded from the actuation logic test. ---------- Perform ACTUATION LOGIC TEST for each train of the load shedder and emergency load sequencer.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ 85,300 gal of fuel.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.2	Verify lubricating oil inventory is ≥ 750 gal.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.4	Verify pressure in two starting air receivers is ≥ 435 psig or pressure in one starting air receiver is ≥ 610 psig for each DG starting air subsystem.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	In accordance with the Surveillance Frequency Control Program

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources - Operating

LCO 3.8.4 The Train A and Train B DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One DC electrical power subsystem inoperable.	A.1 Restore DC electrical power subsystem to OPERABLE status.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is ≥ 128.4 V on float charge.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE				FREQUENCY
SR 3.8.4.2	Verify no visible corrosion at battery terminals and connectors. OR Verify battery connection resistance is:			In accordance with the Surveillance Frequency Control Program
Connections	60 cells	59 cells	58 cells	
inter-cell	≤ 33 E-6 ohms	≤ 30 E-6 ohms	≤ 27 E-6 ohms	
inter-tier, inter-bank, terminal	≤ 150 E-6 ohms	≤ 150 E-6 ohms	≤ 150 E-6 ohms	
field jumper	NA	≤ 150 E-6 ohms	≤ 150 E-6 ohms	
SR 3.8.4.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.			In accordance with the Surveillance Frequency Control Program
SR 3.8.4.4	Remove visible terminal corrosion, verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.			In accordance with the Surveillance Frequency Control Program
SR 3.8.4.5	Verify battery connection resistance is:			In accordance with the Surveillance Frequency Control Program
Connections	60 cells	59 cells	58 cells	
inter-cell	≤ 33 E-6 ohms	≤ 30 E-6 ohms	≤ 27 E-6 ohms	
inter-tier, inter-bank, terminal	≤ 150 E-6 ohms	≤ 150 E-6 ohms	≤ 150 E-6 ohms	
field jumper	NA	≤ 150 E-6 ohms	≤ 150 E-6 ohms	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.6	Verify each battery charger supplies ≥ 300 amps at ≥ 128.4 V for ≥ 1 hour.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.7	----------NOTES---------- 1. The modified performance discharge test in SR 3.8.4.8 may be performed in lieu of the service test in SR 3.8.4.7. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. ---------- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.8	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. ----------	
	Verify battery capacity is ≥ 85% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	In accordance with the Surveillance Frequency Control Program AND 18 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturer's rating

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR One or more batteries with average electrolyte temperature of the representative cells < 60°F. OR One or more batteries with one or more battery cell parameters not within Category C values.	B.1 Declare associated battery inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify battery cell parameters meet Table 3.8.6-1 Category A limits.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.2	Verify battery cell parameters meet Table 3.8.6-1 Category B limits.	In accordance with the Surveillance Frequency Control Program AND Once within 7 days after a battery discharge < 110 V AND Once within 7 days after a battery overcharge > 150 V
SR 3.8.6.3	Verify average electrolyte temperature of representative cells is $\geq$ 60 °F.	In accordance with the Surveillance Frequency Control Program

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters - Operating

LCO 3.8.7 The required Train A and Train B inverters shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One required inverter inoperable.	A.1	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating" with any vital bus de-energized. ---------- Restore inverter to OPERABLE status.	24 hours
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct inverter voltage and alignment to required AC vital buses.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct inverter voltage and alignments to required AC vital buses.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One DC electrical power distribution subsystem inoperable.	D.1	Restore DC electrical power distribution subsystem to OPERABLE status.	2 hours AND 16 hours from discovery of failure to meet LCO
E. Required Action and associated Completion Time not met.	E.1	Be in MODE 3.	6 hours
	AND		
	E.2	Be in MODE 5.	36 hours
F. Two trains with inoperable distribution subsystems that result in a loss of safety function.	F.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and voltage to AC, DC, and AC vital bus electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Initiate actions to restore required AC, DC, and AC vital bus electrical power distribution subsystems to OPERABLE status. AND A.2.5 Declare associated required residual heat removal subsystem(s) inoperable and not in operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program

3.9 REFUELING OPERATIONS

3.9.1 Boron Concentration

LCO 3.9.1 Boron concentrations of all filled portions of the Reactor Coolant System and the refueling canal, that have direct access to the reactor vessel, shall be maintained within the limit specified in the COLR.

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Boron concentration not within limit.	A.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2	Suspend positive reactivity additions.	Immediately
	AND		
	A.3	Initiate action to restore boron concentration to within limit.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Verify boron concentration is within the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program

3.9 REFUELING OPERATIONS

3.9.2 Unborated Water Source Isolation Valves

LCO 3.9.2 Each valve used to isolate unborated water sources, BG-V0178 and BG-V0601, shall be secured in the closed position.

APPLICABILITY: MODE 6.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each unborated water source isolation valve.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. ----------NOTE---------- Required Action A.3 must be completed whenever Condition A is entered. ---------- One or more valves not secured in closed position.	A.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2	Initiate actions to secure valve in closed position.	Immediately
	AND		
	A.3	Perform SR 3.9.1.1.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.2.1	Verify each valve that isolates unborated water sources, BG-V0178 and BG-V0601, is secured in the closed position.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.9.3.2	----------NOTE---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Suspend CORE ALTERATIONS. AND	Immediately
	A.2 Suspend movement of irradiated fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.4.1	Verify each required containment penetration is in the required status.	In accordance with the Surveillance Frequency Control Program
SR 3.9.4.2	----------NOTE---------- Only required for an open equipment hatch. ---------- Verify the capability to install the equipment hatch.	In accordance with the Surveillance Frequency Control Program
SR 3.9.4.3	Verify each required containment purge isolation valve actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.4 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.5.1	Verify one RHR loop is in operation and circulating reactor coolant at a flow rate of $\geq$ 1000 gpm.	In accordance with the Surveillance Frequency Control Program
SR 3.9.5.2	Verify required RHR loop locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2 Initiate action to restore one RHR loop to operation. AND	Immediately
	B.3 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify one RHR loop is in operation and circulating reactor coolant at a flow rate of $\geq$ 1000 gpm.	In accordance with the Surveillance Frequency Control Program
SR 3.9.6.2	Verify correct breaker alignment and indicated power available to the required RHR pump that is not in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.9.6.3	Verify RHR loop locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program

3.9 REFUELING OPERATIONS

3.9.7 Refueling Pool Water Level

LCO 3.9.7 Refueling pool water level shall be maintained ≥ 23 ft above the top of reactor vessel flange.

APPLICABILITY: During movement of irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Refueling pool water level not within limit.	A.1 Suspend movement of irradiated fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify refueling pool water level is ≥ 23 ft above the top of reactor vessel flange.	In accordance with the Surveillance Frequency Control Program

5.5 Programs and Manuals

5.5.13 Diesel Fuel Oil Testing Program (continued)

a. Acceptability of new fuel oil for use prior to addition to storage tanks by determining that the fuel oil has:

1. an API gravity or an absolute specific gravity within limits,

2. a flash point and kinematic viscosity within limits for ASTM 2D fuel oil, and

3. water and sediment content within the limits for ASTM 2D fuel oil;

b. Other properties for ASTM 2D fuel oil are analyzed within 31 days following sampling and addition to storage tanks; and

c. Total particulate concentration of the fuel oil is $\leq$ 10 mg/l when tested in accordance with ASTM D-2276, Method A, at a Frequency in accordance with the Surveillance Frequency Control Program.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Diesel Fuel Oil Testing Program test frequencies.

5.5.14 Technical Specifications (TS) Bases Control Program

This program provides a means for processing changes to the Bases of these Technical Specifications.

a. Changes to the Bases of the TS shall be made under appropriate administrative controls and reviews.

b. Licensees may make changes to Bases without prior NRC approval provided the changes do not require either of the following:

1. a change in the TS incorporated in the license; or

2. a change to the USAR or Bases that requires NRC approval pursuant to 10 CFR 50.59.

c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the USAR.

(continued)

5.5 Programs and Manuals

5.5.18 Control Room Envelope Habitability Program

A Control Room Envelope (CRE) Habitability Program shall be established and implemented to ensure that CRE habitability is maintained such that, with an OPERABLE Control Room Emergency Ventilation System (CREVS), CRE occupants can control the reactor safely under normal conditions and maintain it in a safe condition following a radiological event, hazardous chemical release, or a smoke challenge. The program shall ensure that adequate radiation protection is provided to permit access and occupancy of the CRE under design basis accident (DBA) conditions without personnel receiving radiation exposures in excess of 5 rem TEDE for the duration of the accident. The program shall include the following elements:

a. The definition of the CRE, CRE boundary, control building envelope (CBE), and CBE boundary.

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

c. Requirements for (i) determining the unfiltered air inleakage past the CRE and CBE boundaries in accordance with the testing methods and at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, and (ii) assessing CRE habitability at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.

The following are exceptions to Section C.1 and C.2 of Regulatory Guide 1.197, Revision 0:

1. The Tracer Gas Test based on the Brookhaven National Laboratory Atmospheric Tracer Depletion (ATD) Method is used to determine the unfiltered air inleakage past the CRE and CBE boundaries. The ATD Method is described in WCNOC letters dated February 21, 2005 (WO 05-0003), June 29, 2007 (WM 07-0057), and September 28, 2007 (ET 07-0045).

d. Measurement, at designated locations, of the CRE pressure relative to the outside atmosphere during the pressurization mode of operation by one train of the CREVS, operating at the flow rate required by the VFTP, at a Frequency in accordance with the Surveillance Frequency Control Program. The results shall be trended and used as part of the periodic assessment of the CRE boundary.

(continued)

5.5 Programs and Manuals

5.5.18 Control Room Envelope Habitability Program (continued)

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

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

5.5.19 Surveillance Frequency Control Program

This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals 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 Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies,” Revision 1.

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 227 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-42

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION, UNIT 1

DOCKET NO. 50-482

1.0 INTRODUCTION

By application dated April 27, 2020 (Reference 1), as supplemented by letter dated October 26, 2020 (Reference 2), the Wolf Creek Nuclear Operating Corporation (the licensee), requested changes to the Wolf Creek Generating Station, Unit 1 (Wolf Creek), Technical Specifications (TSs).

The proposed changes would revise the TSs by relocating specific surveillance requirement (SR) frequencies to a licensee-controlled program in accordance with Nuclear Energy Institute (NEI) 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies" (Reference 3). The U.S. Nuclear Regulatory Commission (NRC or the Commission) staff reviewed and approved NEI 04-10, Revision 1, by letter dated September 19, 2007 (Reference 4). The requested changes are consistent with the NRC-approved Technical Specifications Task Force (TSTF) Standard Technical Specifications (STS) Change Traveler TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control—RITSTF [Risk-Informed TSTF] Initiative 5b" (Reference 5), which provides for the application of NEI 04-10, Revision 1.

The supplemental letter dated October 26, 2020, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on June 16, 2020 (85 FR 36436).

2.0 REGULATORY EVALUATION

2.1 Background

The licensee proposed to modify the Wolf Creek TSs by relocating specific surveillance frequencies to a licensee-controlled program (i.e., the Surveillance Frequency Control Program (SFCP)) in accordance with NEI 04-10, Revision 1. The licensee stated that the proposed changes are consistent with the adoption of NRC-approved TSTF-425, Revision 3. The *Federal Register* notice published on July 6, 2009 (74 FR 31996), announced the availability of

TSTF-425, Revision 3. When implemented, TSTF-425, Revision 3, relocates most periodic frequencies of TS surveillances to the SFCP and provides requirements for the new SFCP in the Administrative Controls section of the TSs. All surveillance frequencies can be relocated except the following:

- Frequencies that reference other approved programs for the specific interval (such as the Inservice Testing Program or the Primary Containment Leakage Rate Testing Program);

- Frequencies that are purely event-driven (e.g., "Each time the control rod is withdrawn to the 'full out' position");

- Frequencies that are event-driven, but have a time component for performing the surveillance on a one-time basis once the event occurs (e.g., "within 24 hours after thermal power reaching ≥ 95% RTP [rated thermal power]"); and

- Frequencies that are related to specific conditions (e.g., battery degradation, age and capacity) or conditions for the performance of a surveillance requirement (e.g., "drywell to suppression chamber differential pressure decrease").

The licensee proposed to relocate the specific surveillance frequencies documented in the license amendment request from the following TS Sections to the SFCP:

3.1 Reactivity Control System
3.2 Power Distribution Limits
3.3 Instrumentation
3.4 Reactor Coolant System (RCS)
3.5 Emergency Core Cooling Systems (ECCS)
3.6 Containment Systems
3.7 Plant Systems
3.8 Electrical Power Systems
3.9 Refueling Operations
5.5 Programs and Manuals

The licensee proposed to add the SFCP to TS Section 5.0, "Administrative Controls," Subsection 5.5, "Programs and Manuals." The SFCP describes the requirements for the program to control changes to the relocated surveillance frequencies. The proposed changes to the Administrative Controls section of the TSs to incorporate the SFCP include a specific reference to NEI 04-10, Revision 1, as the basis for making any changes to the surveillance frequencies once they are relocated out of the TSs. The TS Bases for each affected surveillance would be revised to state that the surveillance frequency is controlled under the SFCP.

In a letter dated September 19, 2007 (Reference 4), the NRC staff approved NEI 04-10, Revision 1, as acceptable for referencing in licensing actions, to the extent specified and under the limitations delineated in NEI 04-10, Revision 1, and in the NRC staff's safety evaluation (SE) for NEI 04-10, Revision 1.

The licensee proposed other changes and deviations from TSTF-425, which are discussed in Section 3.2 of this SE.

2.2 Applicable Commission Policy Statements

In the "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors," dated July 22, 1993 (58 FR 39132), the NRC addressed the use of probabilistic safety analysis (PSA, currently referred to as probabilistic risk assessment or PRA) in STS. In this 1993 publication, the NRC states, in part:

> The Commission believes that it would be inappropriate at this time to allow requirements which meet one or more of the first three criteria [of Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.36] to be deleted from Technical Specifications based solely on PSA (Criterion 4). However, if the results of PSA indicate that Technical Specifications can be relaxed or removed, a deterministic review will be performed. . . .
>
> The Commission Policy in this regard is consistent with its Policy Statement on "Safety Goals for the Operation of Nuclear Power Plants," 51 FR 30028, published on August 21, 1986. The Policy Statement on Safety Goals states in part, ". . . probabilistic results should also be reasonably balanced and supported through use of deterministic arguments. In this way, judgments can be made . . . about the degree of confidence to be given these [probabilistic] estimates and assumptions. This is a key part of the process for determining the degree of regulatory conservatism that may be warranted for particular decisions. This defense-in-depth approach is expected to continue to ensure the protection of public health and safety."
>
> The Commission will continue to use PSA, consistent with its policy on Safety Goals, as a tool in evaluating specific line-item improvements to Technical Specifications, new requirements, and industry proposals for risk-based Technical Specification changes.

Approximately two years later, the NRC provided additional detail concerning the use of PRA in the "Use of Probabilistic Risk Assessment in Nuclear Regulatory Activities; Final Policy Statement," dated August 16, 1995 (60 FR 42622). In this publication, the NRC states in part:

> The Commission believes that an overall policy on the use of PRA methods in nuclear regulatory activities should be established so that the many potential applications of PRA can be implemented in a consistent and predictable manner that would promote regulatory stability and efficiency. In addition, the Commission believes that the use of PRA technology in NRC regulatory activities should be increased to the extent supported by the state-of-the-art in PRA methods and data and in a manner that complements the NRC's deterministic approach. . . .
>
> PRA addresses a broad spectrum of initiating events by assessing the event frequency. Mitigating system reliability is then assessed, including the potential for multiple and common cause failures. The treatment therefore goes beyond the single failure requirements in the deterministic approach. The probabilistic approach to regulation is, therefore, considered an extension and enhancement of traditional regulation by considering risk in a more coherent and complete manner. . . .

Therefore, the Commission believes that an overall policy on the use of PRA in nuclear regulatory activities should be established so that the many potential applications of PRA can be implemented in a consistent and predictable manner that promotes regulatory stability and efficiency. This policy statement sets forth the Commission's intention to encourage the use of PRA and to expand the scope of PRA applications in all nuclear regulatory matters to the extent supported by the state-of-the-art in terms of methods and data. . . . .

Therefore, the Commission adopts the following policy statement regarding the expanded NRC use of PRA:

(1) The use of PRA technology should be increased in all regulatory matters to the extent supported by the state-of-the-art in PRA methods and data and in a manner that complements the NRC's deterministic approach and supports the NRC's traditional defense-in-depth philosophy.

(2) PRA and associated analyses (e.g., sensitivity studies, uncertainty analyses, and importance measures) should be used in regulatory matters, where practical within the bounds of the state-of-the-art, to reduce unnecessary conservatism associated with current regulatory requirements, regulatory guides, license commitments, and staff practices. Where appropriate, PRA should be used to support the proposal for additional regulatory requirements in accordance with 10 CFR 50.109 (Backfit Rule). Appropriate procedures for including PRA in the process for changing regulatory requirements should be developed and followed. It is, of course, understood that the intent of this policy is that existing rules and regulations shall be complied with unless these rules and regulations are revised.

(3) PRA evaluations in support of regulatory decisions should be as realistic as practicable and appropriate supporting data should be publicly available for review.

(4) The Commission's safety goals for nuclear power plants and subsidiary numerical objectives are to be used with appropriate consideration of uncertainties in making regulatory judgments on the need for proposing and backfitting new generic requirements on nuclear power plant licensees.

2.3 Applicable Regulations

In 10 CFR 50.36, "Technical specifications," the NRC established its regulatory requirements related to the content of TSs. Pursuant to 10 CFR 50.36, TSs are required to include items in the following five specific categories related to station operation: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements (SRs); (4) design features; and (5) administrative controls. These categories will remain in the Wolf Creek TSs.

Section 50.36(c)(3) of 10 CFR states, "[s]urveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

Existing regulatory requirements, such as 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants" (i.e., the Maintenance Rule), and 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix B, Criterion XVI, "Corrective Action," require licensee monitoring of surveillance test failures and implementing corrective actions to address such failures. Such failures can result in the licensee increasing the frequency of a surveillance test.

2.4 Applicable Guidance

Regulatory Guide (RG) 1.174, Revision 3, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" (Reference 6), describes an acceptable risk-informed approach for assessing the nature and impact of proposed permanent licensing-basis changes by considering engineering issues and applying risk insights. This RG also provides risk acceptance guidelines for evaluating the results of such evaluations.

RG 1.177, Revision 1, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications" (Reference 7), describes an acceptable risk informed approach specifically for assessing proposed TS changes.

RG 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities" (Reference 8), describes an acceptable approach for determining whether the quality of the PRA, in total or the parts that are used to support an application, is sufficient to provide confidence in the results, such that the PRA can be used in regulatory decisionmaking for light-water reactors.

NUREG-1431, Revision 4.0, "Standard Technical Specifications, Westinghouse Plants," Volume 1, "Specifications," and Volume 2, "Bases" (References 9 and 10, respectively), contain the improved STS for Westinghouse plants. The improved STS were developed based on the criteria in the "Final Policy Statement of Technical Specifications Improvements for Nuclear Power Reactors," dated July 22, 1993 (58 FR 39132), which was subsequently codified by changes to 10 CFR 50.36 (60 FR 36953).

TSTF-425, Revision 3, involves the relocation of most time-based surveillance frequencies to a licensee-controlled program, SFCP, and adds the SFCP to the administrative controls section of TS. TSTF-425, Revision 3, implements the staff-approved NEI 04-10, Revision 1.

3.0 TECHNICAL EVALUATION

The licensee's adoption of TSTF-425, Revision 3, provides for Wolf Creek administrative relocation of applicable surveillance frequencies and provides for the addition of the SFCP to the Administrative Controls section of the TSs. TSTF-425, Revision 3, also provides for the application of NEI 04-10, Revision 1, for any changes to surveillance frequencies within the SFCP. The *Federal Register* notice published on July 6, 2009 (74 FR 31996), which announced the availability of TSTF 425, Revision 3, states that the addition of the SFCP to the TSs provides the necessary administrative controls to require that surveillance frequencies relocated to the SFCP are conducted at a frequency to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. The licensee's application for the changes proposed in TSTF-425, Revision 3, included documentation regarding the PRA technical

adequacy consistent with the guidance provided in RG 1.200, Revision 2, Section 4.2. In accordance with NEI 04-10, Revision 1, PRA and non-PRA methods are used, in combination with plant performance data and other considerations, to identify and justify modifications to the surveillance frequencies of equipment at nuclear power plants. This is in accordance with guidance provided in RG 1.174, Revision 3, and RG 1.177, Revision 1, in support of changes to surveillance test intervals (STIs). In addition, by having the TSs require that changes to the frequencies listed in the SFCP be made in accordance with NEI 04-10, Revision 1, the licensee will be required to monitor the performance of SSCs for which surveillance frequencies are decreased to assure reduced testing does not adversely impact the SSCs.

3.1 RG 1.177 Five Key Safety Principles

RG 1.177, Revision 1, identifies five key principles required for risk-informed changes to TSs. Each of these principles is addressed by the industry methodology document, NEI 04-10, Revision 1.

3.1.1 The Proposed Change Meets Current Regulations

The regulations in 10 CFR 50.36(c)(3) require that TSs will include surveillances, which are "requirements relating to test, calibration, or inspection to assure that necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met." NEI 04-10, Revision 1, provides guidance for relocating the surveillance frequencies from the TSs to a licensee-controlled program by providing an NRC-approved methodology for control of the surveillance frequencies. The surveillances themselves would remain in the TSs, as required by 10 CFR 50.36(c)(3).

This change is consistent with other NRC-approved TS changes in which the surveillance frequencies are relocated to licensee-controlled documents, such as surveillances performed in accordance with the Inservice Testing Program or the Primary Containment Leakage Rate Testing Program. Further, the NEI 04-10, Revision 1, guidance provides for monitoring the performance of SSCs for which surveillance frequencies are decreased to assure that the reduced testing does not adversely impact the SSCs. Thus, this proposed change meets the current regulations for monitoring surveillance test failures and implementing corrective actions to address such failures, in accordance with 10 CFR 50.65 and 10 CFR Part 50, Appendix B, Criterion XVI.

Therefore, the proposed change meets the first key principle of RG 1.177, Revision 1, by complying with current regulations.

3.1.2 The Proposed Change Is Consistent with the Defense-in-Depth Philosophy

Consistency with the defense-in-depth philosophy is maintained if:

- A reasonable balance is preserved among prevention of core damage, prevention of containment failure, and consequence mitigation.

- Over-reliance on programmatic activities to compensate for weaknesses in plant design is avoided.

- System redundancy, independence, and diversity are preserved commensurate with the expected frequency, consequences of challenges to the system, and uncertainties (e.g.,

no risk outliers). Because the scope of the proposed methodology is limited to revision of surveillance frequencies, the redundancy, independence, and diversity of plant systems are not impacted.

- Defenses against potential common cause failures (CCFs) are preserved, and the potential for the introduction of new common cause failure mechanisms is assessed.

- Independence of barriers is not degraded.

- Defenses against human errors are preserved.

- The intent of the plant's General Design Criteria in 10 CFR Part 50, Appendix A, is maintained.

TSTF-425, Revision 3, requires the application of NEI 04-10, Revision 1, for any changes to surveillance frequencies within the SFCP. NEI 04-10, Revision 1, uses both the core damage frequency (CDF) and the large early release frequency (LERF) metrics to evaluate the impact of proposed changes to surveillance frequencies. The guidance in RG 1.174, Revision 3, and RG 1.177, Revision 1, for changes to CDF and LERF is achieved by evaluation using a comprehensive risk analysis, which assesses the impact of proposed changes including contributions from human errors and CCFs. Defense-in-depth is also included in the methodology explicitly as a qualitative consideration outside of the risk analysis, as is the potential impact on detection of component degradation that could lead to increased likelihood of CCFs. Both the quantitative risk analysis and the qualitative considerations assure a reasonable balance of defense-in-depth is maintained to provide reasonable assurance of protection of public health and safety, satisfying the second key principle of RG 1.177, Revision 1.

3.1.3 The Proposed Change Maintains Sufficient Safety Margins

The engineering evaluation that will be conducted by the licensee under the SFCP when frequencies are revised will assess the impact of the proposed frequency change with the principle that sufficient safety margins are maintained. The guidelines used for making that assessment will include ensuring the proposed surveillance test frequency change is not in conflict with approved industry codes and standards or adversely affects any assumptions or inputs to the safety analysis; or, if such inputs are affected, justification is provided to ensure sufficient safety margin will continue to exist.

The design, operation, testing methods, and acceptance criteria for SSCs, specified in applicable codes and standards (or alternatives authorized for use by the NRC) will continue to be met as described in the plant licensing basis (including the Updated Final Safety Analysis Report and TS Bases), because these are not affected by changes to the surveillance frequencies. Similarly, there is no impact to safety analysis acceptance criteria as described in the plant licensing basis.

Thus, safety margins are maintained by the proposed methodology and therefore, the third key principle of RG 1.177, Revision 1, is satisfied.

3.1.4 When Proposed Changes Result in an Increase in CDF or Risk, the Increases Should Be Small and Consistent with the Intent of the Commission's Safety Goal Policy Statement

The guidance in RG 1.177, Revision 1, provides a framework for evaluation of the risk of proposed changes to surveillance frequencies, which requires identification of the risk contribution from impacted surveillances, determination of the risk impact from the change to the proposed surveillance frequency, and performance of sensitivity and uncertainty evaluations. TSTF-425, Revision 3, requires application of NEI 04-10, Revision 1, in the SFCP. The guidance in NEI 04-10, Revision 1, satisfies the intent of RG 1.177, Revision 1, requirements for evaluation of the change in risk and for assuring that such changes are small. Thus, the licensee's proposed relocation of specific surveillance frequencies to the SFCP in accordance with NEI 04-10, Revision 1, and TSTF-425, Revision 3, satisfies the fourth key principle of RG 1.177, Revision 1.

3.1.4.1 Technical Acceptability of PRAs

The NRC staff's review of the technical acceptability of the licensee's PRAs supporting this application is consistent with the safety implications of the proposed TS change, and the role the PRA plays in justifying the change. That is, the more the potential change in risk or the greater the uncertainty in that risk that results from the requested TS change, or both, the greater the rigor that must go into ensuring the acceptability of the PRA.

The licensee used RG 1.200, Revision 2, to address the plant PRA technical acceptability for this application. RG 1.200, Revision 2, provides regulatory guidance for assessing the technical acceptability of a PRA and endorses (with clarifications and qualifications) the use of the following:

1. American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) RA-Sa-2009, "Addenda to ASME RA-S-2008 Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications" (hereafter referred to as the ASME/ANS PRA Standard) (Reference 11);

2. NEI 00-02, Revision 1, "Probabilistic Risk Assessment (PRA) Peer Review Process Guidance" (Reference 12); and

3. NEI 05-04, Revision 2, "Process for Performing Internal Events PRA Peer Reviews Using the ASME/ANS PRA Standard" (Reference 13).

The licensee has performed an assessment of the PRA models used to support the SFCP against the guidance provided in RG 1.200, Revision 2, to assure that the PRA models, using plant specific data and models, are capable of determining the change in risk due to changes to surveillance frequencies of SSCs. NEI 04-10 states that Capability Category II (CC-II) of the ASME/ANS PRA Standard should be met, and any identified deficiencies to the CC-II supporting requirements of the ASME/ANS PRA Standard are assessed further to determine any impacts to proposed decreases to surveillance frequencies, including the use of sensitivity studies, as appropriate. This level of PRA acceptability is sufficient to support the evaluation of changes proposed to surveillance frequencies within the SFCP and is consistent with Regulatory Position 2.3.1, "Technical Adequacy of the PRA," of RG 1.177, Revision 1.

Internal Events and Internal Flooding PRA

Upon implementation of the SFCP, the licensee will determine whether the SSCs affected by a proposed change to a surveillance frequency are modeled in the internal events and internal flooding PRA. The NRC staff reviewed Table 3-1, "WCGS [Wolf Creek] Open PRA Peer Review Findings," of Attachment II to the license amendment request (LAR), which summarized the peer review team assessment of the Wolf Creek PRA models that do not conform to CC-II of the ASME/ANS PRA Standard supporting requirements. The NRC staff's assessment of these open finding level facts and observations (F&Os), the impacted supporting requirements, and the licensee's resolutions concluded that they are addressed and dispositioned for this application per the NEI 04-10 guidance, as discussed below.

F&O 3-8, associated with Supporting Requirements AS-C3, HR-I3, IE-D3, SC-C3, SY-C3, and QU-F4, was generated because of a lack of a clear method for identification and characterization of key plant-specific assumptions and sources of uncertainty. In the LAR, the licensee stated that plant-specific sources of uncertainty were being collected and characterized in the individual PRA notebooks to resolve this issue. In the response to NRC Request for Additional Information (RAI) No. 1, by letter dated October 26, 2020, the licensee stated that this action will be complete prior to implementation of the SFCP. The NRC staff finds this acceptable because the key plant-specific assumptions and sources of uncertainty will be identified and characterized in accordance with the ASME/ANS PRA Standard before the SFCP is in effect, and because NEI 04-10, Revision 1, includes guidance on the performance of sensitivity studies related to key assumptions and causes of uncertainty as discussed in Section 3.1.4.5 of this SE.

F&O 4-10, associated with Supporting Requirement LE-C13, was generated because the documentation for how steam generator tube ruptures (SGTRs) were modeled does not provide sufficient technical basis to justify the credit taken. Additionally, the simplified approach for interfacing system loss-of-coolant accident (ISLOCA) releases does not discuss any consideration of potential scrubbing credit. The licensee stated that the Wolf Creek LERF PRA model only treats those SGTRs where steam generator isolation has failed as generating a large and early release, and that with successful steam generator isolation, the containment is not completely bypassed and therefore, these SGTRs do not result in a large and early release. Further, the licensee stated that in the case of failed steam generator isolation, fission product scrubbing via secondary side inventory is not realistic for most scenarios because of the uncertainty of the leak location and the availability of a sufficient water pool above the leak to scrub fission products from a potential release.

Regarding not taking credit for potential ISLOCA scrubbing, the licensee stated that crediting scrubbing for ISLOCA sequences requires complex modeling of the release pathway through the auxiliary building in order to track fission product plate out prior to offsite release, and that this is beyond the state of practice in the industry.

The SFCP process for extending an STI is not affected by the issue discussed in F&O 4-10 because the STI evaluation determines the change in risk, and the uncredited actions will affect similarly the original and the extended interval risk with little or no impact on the change in risk. Therefore, the NRC staff finds that the change in risk would not be expected to be significantly impacted by modeling SGTR or ISLOCA scrubbing, and therefore, the licensee's disposition of F&O 4-10 is acceptable for this application.

F&O 6-8, associated with Supporting Requirement SY-C2, was generated because walkdowns and interviews were performed but not documented. In the LAR, the licensee stated that the majority of the system engineer interviews have been completed and documented in the corresponding systems analyses notebooks.

In the response to NRC RAI No. 2 in the supplemental letter dated October 26, 2020, the licensee stated that the outstanding interview has taken place, and that the interview confirmed the relevant modeling assumptions and conclusions. The licensee further stated that the documentation of the interview would be incorporated into the model of record. The NRC staff finds this acceptable because the goal of the F&O (confirming relevant modeling assumptions and conclusions with knowledgeable experts) has been achieved, and this result will be documented in the PRA model documentation going forward.

F&O AS-B3-01, associated with Supporting Requirement AS-B3, was generated because feed and bleed scenarios involving open power operated relief valves did not consider the potential for sump strainer blockage. In the LAR, the licensee stated that sump blockage is accounted for in loss-of-coolant accident and reactor coolant pump seal leakage events. The licensee further stated that a sensitivity study was performed to determine the impact of not limiting sump blockage to loss-of-coolant accident type events, and the results did not impact this application. Based on these results, the NRC staff finds that F&O AS-B3-01 would be expected to have a negligible impact on STI calculations.

Conclusion

Based on its review, the NRC staff concludes that the licensee's internal events PRA, including internal flooding, is technically acceptable to support the evaluation of changes proposed to surveillance frequencies within the SFCP using the process in NEI 04-10, Revision 1, and is consistent with Regulatory Position 2.3.1 of RG 1.177, Revision 1.

3.1.4.2 Scope of the PRA

Upon implementation of the SFCP, the licensee must evaluate each proposed change to a relocated surveillance frequency using the guidance contained in NEI 04-10, Revision 1, to determine its potential impact on risk, due to impacts from internal events, fires, seismic, other external events, and from shutdown conditions. Consideration is made of both CDF and LERF metrics.

Wolf Creek has full-power internal event and internal flood PRA models. These models received peer reviews as discussed in Section 3.1.4.1 of this SE. In accordance with NEI 04-10, Revision 1, the licensee will use these models to perform quantitative evaluations to support the development of changes to surveillance frequencies in the SFCP. The NRC staff finds that the use of these models is acceptable because the NRC-approved methodology in NEI 04-10, Revision 1, allows for more refined analysis to be performed to support changes to surveillance frequencies in the SFCP.

Wolf Creek does not have a PRA model for internal fires. However, the licensee performed a Fire Induced Vulnerability Evaluation (FIVE) for Wolf Creek in response to Individual Plant Examination of External Events, Generic Letter 88-20, Supplement 4, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities - 10 CFR 50.54(f)" (Reference 14). The licensee performed its FIVE for Wolf Creek in accordance with Electric Power Research Institute (EPRI) Topical Report (TR)-100370, "Fire-Induced Vulnerability

Evaluation (FIVE)" (Reference 15). The licensee will assess the impacts on fire risk of an STI extension using a qualitative or a bounding approach supplemented with insights from the IPEEE FIVE analysis and the in-development fire PRA model. Based on its review, the NRC staff finds that the licensee's approach is acceptable for this application because it is consistent with the guidance in NEI 04-10, Revision 1.

The licensee does not have PRA models for seismic events, high winds, and external flooding events. These events were assessed in the licensee's IPEEE, Generic Letter 88-20, Supplement 4. In Section 5, "External Events Considerations," of Attachment II to the LAR, the licensee stated that Wolf Creek is currently developing a seismic PRA, but it has neither been completed nor peer reviewed. A seismic margins assessment (SMA) was performed with a review level earthquake at 0.3 gravity peak ground acceleration during the IPEEE. The licensee proposed to assess SSCs impacted by frequency changes in the proposed program against the SMA consistent with the endorsed guidance in NEI 04-10.

The SMA in the licensee's IPEEE concluded that only a few instances are required for a detailed review to screen equipment anchorages to a high confidence of a low probability of failure of at least 0.3 gravity peak ground acceleration. The licensee's recent seismic hazard and screening report (Reference 16) shows that the ground motion response spectrum for the Wolf Creek site is higher than the safe shutdown earthquake at a frequency of about 5 hertz or higher. In response to RAI No. 5, by letter dated in October 26, 2020, the licensee stated that sources of insights used in its SFCP for a qualitative evaluation of seismic risk will include the SMA from the IPEEE, the more recent Expedited Seismic Evaluation Process Report, and the seismic PRA model when it is complete. Based on its review, the NRC staff finds that the use of the SMA and insights from recent assessments for seismic events are consistent with the guidance in NEI 04-10, Revision 1.

In Section 5.0, "External Events Considerations," of Attachment II to the LAR, the licensee stated that Wolf Creek has developed a high winds PRA model and conducted an external events screening assessment in accordance with Parts 6 and 7 of the ASME/ANS PRA Standard. However, given that the high winds PRA model still has outstanding F&Os that need to be addressed, the licensee proposed to utilize the IPEEE analysis for high winds and tornadoes for the STI change evaluations. In response to RAI No. 6, by letter dated in October 26, 2020, the licensee stated that sources of insights used in its SFCP for a qualitative evaluation of high winds and tornado risk will include the IPEEE and the high winds PRA when it is complete. Based on its review, the NRC staff finds that the use of the IPEEE analysis and insights from recent assessments for high winds and tornadoes are consistent with the guidance in NEI 04-10, Revision 1.

In Section 5.0 of Attachment II to the LAR, the licensee stated that other external hazards, including external flooding, were determined in the IPEEE to be negligible contributors to overall plant risk. In the licensee's recent flood hazard reevaluation report (Reference 17), the licensee determined that the current design basis does not bound the reevaluated local intense precipitation hazard. In response to RAI No. 7, by letter dated in October 26, 2020, the licensee stated that sources of insights used in its SFCP for a qualitative evaluation of external flooding risk will include the IPEEE and the more recent flood hazard reevaluation, and the external events screening assessment. Based on its review, the NRC staff finds that the use of the IPEEE analysis and insights from recent assessments for external flooding are consistent with the guidance in NEI 04-10, Revision 1.

Based on the supplemental letter dated October 26, 2020, the licensee stated that it will address the impact of all external hazards on a specific STI extension using a qualitative approach that follows the methodology of NEI 04-10, Revision 1, as endorsed by the NRC staff. The licensee stated that its approach will be contained in the Wolf Creek SFCP procedures. The licensee explained that for the unscreened external hazards, qualitative insights will be developed from available sources and the licensee's program will require that these qualitative risk insights, the basis for qualitative conclusions and the uncertainties or limitations associated with those insights relevant to the specific STI extension, be presented to the independent decision-making panel (IDP) for consideration.

The NRC staff notes that in accordance with NEI 04-10, Revision 1, the licensee can perform an initial qualitative screening analysis, and, if the qualitative information is insufficient to provide confidence that the net impact of the STI change would be negligible, a bounding analysis will be performed. The licensee stated that its approach will use a qualitative process, and bounding analyses where appropriate, for assessing the risk impact of extending the surveillance frequency on SSCs for non-PRA modeled hazards and shutdown events.

Based on its review of the LAR, as supplemented, and the endorsed guidance in NEI 04-10, Revision 1, the NRC staff finds that (1) the licensee's approach for considering impacts from internal fires, seismic hazards, high winds and tornadoes, external flooding, and other external hazards on STI extensions is consistent with the NRC staff endorsed guidance in NEI 04-10, Revision 1, and (2) the qualitative risk insights from these external hazards will be presented to the IDP for consideration. Therefore, the NRC staff concludes that internal fires, seismic hazards, high winds and tornadoes, external flooding, and other external hazards are appropriately considered in the licensee's proposed SFCP.

The licensee stated that for assessing the shutdown risk, it will use the shutdown risk management program for implementation of Nuclear Management and Resources Council 91-06, "Guidelines for Industry Actions to Assess Shutdown Management" (Reference 18), for the proposed changes to surveillance frequencies under the SFCP. This is an acceptable approach in accordance with NEI 04-10, Revision 1.

Thus, the NRC staff finds that the licensee's evaluation methodology ensures that the scope of the risk contribution of each surveillance frequency change is properly identified for evaluation and is consistent with Regulatory Position 2.3.2, "Scope of the Probabilistic Risk Assessment for Technical Specification Change Evaluations," of RG 1.177, Revision 1.

3.1.4.3 PRA Modeling

Consistent with NEI 04-10, Revision 1, upon implementation of the SFCP, the licensee stated that it will determine whether the SSCs affected by a proposed change to a surveillance frequency are modeled in the PRA. Where the SSC is directly or implicitly modeled, a quantitative evaluation of the risk impact may be carried out. The methodology adjusts the failure probability of the impacted SSCs, including any impacted common cause failure modes, based on the proposed change to the surveillance frequency. Where the SSC is not modeled in the PRA, bounding analyses are performed to characterize the impact of the proposed change to surveillance frequency. Potential impacts on the risk analyses due to screening criteria and truncation levels are addressed by the requirements for PRA technical adequacy consistent with the guidance provided in RG 1.200, Revision 2, and by sensitivity studies identified in NEI 04-10, Revision 1.

The licensee stated that it will perform quantitative evaluations of the impact of selected testing strategy (i.e., staggered testing or sequential testing) consistently with the guidance of NUREG/CR-6141, “Handbook of Methods for Risk-Based Analyses of Technical Specifications” (Reference 19) and NUREG/CR-5497, “Common-Cause Failure Parameter Estimations” (Reference 20), as discussed in NEI 04-10, Revision 1.

Thus, the NRC staff finds that through the application of NEI 04-10, Revision 1, the licensee’s PRA modeling is sufficient to ensure an acceptable evaluation of risk for the proposed changes in surveillance frequency and is consistent with Regulatory Position 2.3.3, “Probabilistic Risk Assessment Modeling,” of RG 1.177, Revision 1.

3.1.4.4 Assumptions for Time-Related Failure Contributions

The failure probabilities of SSCs modeled in the licensee’s PRAs assume all failures to be time-related because the breakdown between standby time-related contribution and a cyclic demand-related contribution is unknown. The NEI 04-10, Revision 1, criteria adjust the time-related failure contribution of SSCs affected by the proposed change to a surveillance frequency. This is consistent with the guidance in RG 1.177, Revision 1, Section 2.3.3, “Probabilistic Risk Assessment Modeling,” which permits separation of the failure rate contributions into demand and standby for evaluation of Supporting Requirements. According to the guidance in NEI 04-10, Revision 1, if the available data do not support distinguishing between the time-related failures and demand failures, then the change to surveillance frequency is conservatively assumed to impact the total failure probability of the SSC, including both standby and demand contributions. The SSC failure rate (per unit time) is assumed to be unaffected by the change in test frequency and will be confirmed by the required monitoring and feedback implemented after the change in surveillance frequency is implemented. The process requires consideration of qualitative sources of information with regards to potential impacts of test frequency on SSC performance, including industry and plant-specific operating experience, vendor recommendations, industry standards, and code-specified test intervals. Thus, the process is not reliant upon risk analyses as the sole basis for the proposed changes.

The potential beneficial risk impacts of reduced surveillance frequency, including reduced downtime, lesser potential for restoration errors, reduction of potential for test caused transients, and reduced test-caused wear of equipment, are identified qualitatively, but are conservatively not required to be quantitatively assessed.

Thus, the NRC staff finds that through the application of NEI 04-10, Revision 1, the licensee has employed reasonable assumptions with regard to extensions of STIs and is consistent with Regulatory Position 2.3.4, “Assumptions in Completion Time and Surveillance Frequency Evaluations,” of RG 1.177, Revision 1.

3.1.4.5 Sensitivity and Uncertainty Analyses

NEI 04-10, Revision 1, provides that sensitivity studies be performed to assess the impact of uncertainties from key assumptions of the PRA, uncertainty in the failure probabilities of the affected SSCs, impact to the frequency of initiating events, and of any identified deviations from CC-II of the ASME/ANS PRA Standard, as endorsed in RG 1.200, Revision 2. Where the sensitivity analyses identify a potential impact on the proposed change, revised surveillance frequencies are considered, along with any qualitative considerations that may bear on the results of such sensitivity studies. Guidance in Step 5 of NEI 04-10, Revision 1, specifies risk

sensitivity studies to be conducted by changing the unavailability terms for PRA basic events that correspond to SSCs being evaluated.

Consistent with NEI 04-10, Revision 1, monitoring and feedback of SSC performance once the revised surveillance frequencies are implemented will also be performed. Therefore, the NRC staff finds that through the application of NEI 04-10, Revision 1, the licensee has appropriately considered the possible impact of PRA model uncertainty and sensitivity to key assumptions and model limitations, consistent with Regulatory Position 2.3.5, "Sensitivity and Uncertainty Analyses Relating to Assumptions in Technical Specification Change Evaluations," of RG 1.177, Revision 1.

3.1.4.6 Acceptance Guidelines

The licensee states that it will quantitatively evaluate the change in total risk (including internal and external events contributions) in terms of CDF and LERF for both the individual risk impact of a proposed change in surveillance frequency and the cumulative impact from all individual changes to surveillance frequencies using the guidance provided in NEI 04-10, Revision 1, as required in the SFCP. Each individual change to surveillance frequency must show a risk impact below 10^{-6} per year for change to CDF, and below 10^{-7} per year for change to LERF. These are consistent with the limits of RG 1.174, Revision 3, for very small changes in risk. Where the RG 1.174, Revision 3, limits are not met, the process either considers revised surveillance frequencies, which are consistent with RG 1.174, Revision 3, or the process terminates without permitting the proposed changes. Where quantitative results are unavailable to permit comparison to acceptance guidelines, appropriate qualitative analyses are required to demonstrate that the associated risk impact of a proposed change to the surveillance frequency is negligible or zero. Otherwise, bounding quantitative analyses are required, which demonstrate the risk impact is at least one order of magnitude lower than the RG 1.174, Revision 3, acceptance guidelines for very small changes in risk. In addition to assessing each individual SSC surveillance frequency change, the cumulative impact of all changes must result in a risk impact below 10^{-5} per year for change to CDF, and below 10^{-6} per year for change to LERF, and the total CDF and total LERF must be reasonably shown to be less than 10^{-4} per year and 10^{-5} per year, respectively. These values are consistent with the limits of RG 1.174, Revision 3, for acceptable changes in risk, as referenced by RG 1.177, Revision 1, for changes to surveillance frequencies.

Consistent with the NRC's safety evaluation for NEI 04-10, Revision 1, dated September 19, 2007, the SFCP provides that the licensee must calculate the change in risk from a baseline model utilizing failure probabilities based on the surveillance frequencies prior to implementation of the SFCP, compared to a revised model with failure probabilities based on changed surveillance frequencies. The NRC staff notes that the licensee's SFCP includes a provision to exclude the contribution to cumulative risk from individual changes to surveillance frequencies associated with insignificant risk increases (less than 5×10^{-8} CDF and 5×10^{-9} LERF) once the baseline PRA models are updated to include the effects of the revised surveillance frequencies.

The quantitative acceptance guidance of RG 1.174, Revision 3, is supplemented by qualitative information to evaluate the proposed changes to surveillance frequencies, including industry and plant-specific operating experience, vendor recommendations, industry standards, the results of sensitivity studies, and SSC performance data and test history. The final acceptability of the proposed change is based on all of these considerations and not solely on the PRA results compared to numerical acceptance guidelines. Post-implementation performance monitoring and feedback are also required to assure continued reliability of the components.

Based on its review, the NRC staff finds that the licensee's application of NEI 04-10, Revision 1, provides reasonable acceptance guidelines and methods for evaluating the risk increase of proposed changes to surveillance frequencies, consistent with Regulatory Position 2.4, "Acceptance Guidelines for Technical Specification Changes," of RG 1.177, Revision 1. Therefore, the NRC staff concludes that the proposed licensee methodology satisfies the fourth key safety principle of RG 1.177, Revision 1, by assuring any increase in risk is small consistent with the intent of the Commission's Safety Goal Policy Statement.

3.1.5 The Impact of the Proposed Change Should Be Monitored Using Performance Measurement Strategies

The licensee's adoption of TSTF-425, Revision 3, requires application of NEI 04–10, Revision 1, in the SFCP. NEI 04-10, Revision 1, provides for performance monitoring of SSCs whose surveillance frequency has been revised as part of a feedback process to assure that the change in test frequency has not resulted in degradation of equipment performance and operational safety. The monitoring and feedback include consideration of maintenance rule monitoring of equipment performance. In the event of a degradation of SSC performance, the surveillance frequency will be reassessed in accordance with the methodology, in addition to any corrective actions which may apply as part of the maintenance rule requirements. Therefore, the NRC staff finds that performance monitoring and feedback specified in NEI 04-10, Revision 1, is sufficient to reasonably assure acceptable SSC performance and is consistent with Regulatory Position 3.2, "Maintenance Rule Control," of RG 1.177, Revision 1.

Thus, the NRC staff concludes that the fifth key safety principle of RG 1.177, Revision 1, is satisfied.

3.2 Deviations From TSTF-425 and Other Changes

In Sections 2.2.1 and 2.2.2 of the LAR, as supplemented, the licensee identified variations and technical changes from the TSTF-425 template. The NRC staff's evaluation of those changes is discussed below.

- The licensee stated that Wolf Creek SRs have numbers that differ from the corresponding Westinghouse Standard Technical Specifications (NUREG-1431) TSTF-425 SRs. The NRC staff finds that the different SR numbering is acceptable because they are editorial in nature and do not substantively change the TS requirements.

- The licensee stated that for NUREG-1431 SRs not contained in the Wolf Creek TSs, the corresponding mark-ups included in TSTF-425 for these SRs are not applicable to Wolf Creek. The NRC staff finds this variation acceptable because it is editorial in nature and does not substantively change the TS requirements.

- The TSTF-425 TS Section 5.5.18 insert for the new SFCP references NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies." The licensee is adopting this new program as TS Section 5.5.19 and references NEI 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies." The NRC staff finds this variation acceptable because it is editorial in nature and continues to meet the intent of TSTF-425, Revision 3.

- The licensee proposed to replace the TS Bases insert, "The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program," which is provided in TSTF-425, Revision 3. The licensee proposed that the new text reads, "The Surveillance Frequency is controlled under the Surveillance Frequency Control Program," or "The Surveillance Frequencies are controlled under the Surveillance Frequency Control Program," as appropriate. In a letter dated April 14, 2010 (Reference 21), the NRC staff agreed that the insert applies to surveillance frequencies that are relocated and subsequently evaluated and changed in accordance with the SFCP but does not apply to frequencies relocated to the SFCP, but not changed. The NRC staff finds the licensee proposed variation acceptable because it is editorial in nature and continues to meet the intent of TSTF-425, Revision 3.

- The licensee identified several Wolf Creek plant-specific SRs with fixed periodic frequencies that are not contained in NUREG-1431, and therefore, are not included in TSTF-425. The licensee assessed these SRs and determined that the relocation of the frequencies for these SRs is consistent with TSTF-425. The licensee requested that these surveillances be controlled under the SFCP.

  The SFCP provides administrative controls such that surveillances related to testing, calibration, and inspection are conducted at a frequency to assure that the necessary quality of the systems and components is maintained, the facility operation will be within safety limits, and that the limiting conditions for operation will be met. The SFCP provides that changes to the frequencies be evaluated using the methodology and probabilistic risk guidelines provided in NEI 04-10, Revision 1, as approved by NRC letter dated September 19, 2007. The NEI 04-10, Revision 1, methodology includes qualitative considerations, risk analyses, sensitivity studies, and bounding analyses, as necessary, and recommends monitoring of the performance of SSCs for which frequencies are changed to assure that reduced testing does not adversely impact the SSCs.

  For example, the licensee included Wolf Creek TS 5.5.13 in the scope of this amendment. This TS has a periodic frequency that was not identified for relocation in TSTF-425, Revision 3. TS 5.5.13.c is revised as follows (deleted text in strikeout and added text in *italics*):

  > Total particulate concentration of the fuel oil is ≤ 10 mg/l [milligrams per liter] when tested ~~every 31 days~~ in accordance with ASTM [American Society of Testing & Materials] D-2276, Method*, at a Frequency in accordance with the Surveillance Frequency Control Program*.

  The NRC staff evaluated the proposed deviations for the identified plant-specific TS SRs listed in Attachment 7 of the LAR and determined that the SR frequencies do not meet any of the exclusion criteria in TSTF-425, Revision 3, and that the frequencies are fixed periodic frequencies. Therefore, the NRC staff finds that relocation of these plant-specific TS SR frequencies to the SFCP is acceptable.

- The licensee proposed to revise TS 5.5.18.d. The proposed revision would delete "of 18 months on a STAGGERED TEST BASIS" and replace it with "in accordance with the Surveillance Frequency Control Program." TSTF-425 includes the relocation of the frequency for the NUREG-1431, SR 3.7.10.4, associated with verifying that one Control

Room Emergency Ventilation System (CREVS) train can maintain a positive pressure relative to adjacent area(s). The licensee proposed to adopt the frequency change identified for the NUREG-1431, SR 3.7.10.4, in TSTF-425 as the Wolf Creek TS 5.5.18.d frequency.

The NRC staff finds this variation acceptable because the frequency for Wolf Creek TS SR 3.7.10.4 has been moved to TS 5.5.18.d with the facility's adoption of TSTF-448, "Control Room Habitability" (Reference 22). The frequency located in TS 5.5.18.d is a periodic frequency, does not meet the scope exclusion criteria, and is consistent with the intent of TSTF-425. SR 3.7.10.4 was revised under TSTF-448, to perform control room envelope unfiltered air in-leakage testing in accordance with the Control Room Envelope Habitability Program. The licensee adopted TSTF-448 and designated the Control Room Envelope Habitability Program as TS 5.5.18.

- Due to the relocation of SR frequencies and replacing the frequencies with the statement, "In accordance with the Surveillance Frequency Control Program," there are multiple SRs that moved to the next page in the TSs. The licensee made various formatting changes, such as inserting new pages due to text rollover and changes to the table of contents. The NRC staff reviewed the changes and determined that they are editorial in nature and are therefore acceptable.

3.3 Addition of Surveillance Frequency Control Program to TS Section 5

The licensee proposed including the SFCP and specific requirements into Wolf Creek TS Section 5.5.19, "Programs and Manuals," as follows:

> Surveillance Frequency Control Program
>
> This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure that 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 Technical Specifications Initiative 5b, Risk- Informed Method for Control of Surveillance Frequencies,'' Revision 1.
>
> c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

The proposed program is consistent with the model application of TSTF-425 and, therefore, the NRC staff concludes that it is acceptable.

3.4 Summary and Technical Conclusions

The NRC staff has reviewed the licensee's proposed relocation of certain surveillance frequencies to a licensee-controlled document and its proposed control of changes to surveillance frequencies in accordance with a new program, the SFCP, identified in the administrative controls of the TSs. The SFCP and the new TS Section 5.5.19 reference NEI 04-10, Revision 1, which provides a risk-informed methodology using plant-specific risk insights and performance data to revise surveillance frequencies within the SFCP. This methodology supports relocating surveillance frequencies from the TS to a licensee-controlled document, provided those frequencies are changed in accordance with NEI 04-10, Revision 1, which is specified in the administrative controls of the TS.

The licensee's proposed adoption of TSTF-425, Revision 3, and the risk-informed methodology of NEI 04-10, Revision 1, as referenced in the Administrative Controls section of the TSs, satisfies the key principles of risk-informed decisionmaking applied to changes to TS as delineated in RG 1.177, Revision 1, and RG 1.174, Revision 3, in that:

- The proposed change meets current regulations;
- The proposed change is consistent with defense-in-depth philosophy;
- The proposed change maintains sufficient safety margins;
- Increases in risk resulting from the proposed change are small and consistent with the Commission's Safety Goal Policy Statement; and
- The impact of the proposed change is performance monitoring using measurement strategies.

The NRC staff finds that with the proposed relocation of surveillance frequencies to an owner-controlled document and administratively controlled in accordance with the TS SFCP, the licensee continues to meet the regulatory requirement of 10 CFR 50.36, specifically, 10 CFR 50.36(c)(3), Surveillance Requirements.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Kansas State official was notified of the proposed issuance of the amendment on December 18, 2020. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and changes SRs. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, published in the *Federal Register* on June 16, 2020 (85 FR 36436), and there has been no public comment on such finding. Accordingly, the

amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

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

7.0 REFERENCES

1. Smith, S. L., Wolf Creek Nuclear Operating Corporation, letter to U.S. Nuclear Regulatory Commission, "Docket No. 50-482: Application for Technical Specification Change Regarding Risk-Informed Justification for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program (TSTF-425)," dated April 27, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20119A873).

2. Smith, S. L., Wolf Creek Nuclear Operating Corporation, letter to U.S. Nuclear Regulatory Commission, "Docket No. 50-482: Response to Request for Additional Information Re 'Application for Technical Specification Change Regarding Risk-Informed Justification for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program (TSTF-425),'" dated October 26, 2020 (ADAMS Accession No. ML20300A569).

3. Nuclear Energy Institute, "Risk-Informed Technical Specifications Initiative 5b, Risk Informed Method for Control of Surveillance Frequencies," NEI 04-10, Revision 1, dated April 2007 (ADAMS Accession Number ML071360456).

4. Nieh, H. K., U.S. Nuclear Regulatory Commission, letter to B. Bradley, Nuclear Energy Institute, "Final Safety Evaluation for Nuclear Energy Institute (NEI) Topical Report (TR) 04 10, Revision 1, "Risk-Informed Technical Specification Initiative 5b, 'Risk-Informed Method for Control of Surveillance Frequencies' (TAC NO. MD6111)," dated September 19, 2007 (ADAMS Accession No. ML072570267).

5. Technical Specifications Task Force, letter and enclosure to U.S. Nuclear Regulatory Commission, "Transmittal of TSTF-425, Revision 3, 'Relocate Surveillance Frequencies to Licensee Control - RITSTF Initiative 5b,'" dated March 18, 2009 (ADAMS Accession No. ML090850642).

6. U.S. Nuclear Regulatory Commission, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Regulatory Guide 1.174, Revision 3, dated January 2018 (ADAMS Accession No. ML17317A256).

7. U.S. Nuclear Regulatory Commission, “An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications,” Regulatory Guide 1.177, Revision 1, dated May 2011 (ADAMS Accession No. ML100910008).

8. U.S. Nuclear Regulatory Commission, “An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities,” Regulatory Guide 1.200, Revision 2, dated March 2009 (ADAMS Accession No. ML090410014).

9. U.S. Nuclear Regulatory Commission, “Standard Technical Specifications – Westinghouse Plants,” NUREG-1431, Revision 4, Volume 1, “Specifications,” dated April 2012 (ADAMS Accession No. ML12100A222).

10. U.S. Nuclear Regulatory Commission, “Standard Technical Specifications – Westinghouse Plants,” NUREG-1431, Revision 4, Volume 2, “Bases,” dated April 2012 (ADAMS Accession No. ML12100A228).

11. American Society of Mechanical Engineers and American Nuclear Society (ASME/ANS) PRA Standard, ASME/ANS RA-Sa-2009, Addenda to ASME RA-S-2008, “Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications,” dated February 2009, New York, NY.

12. Nuclear Energy Institute, “Probabilistic Risk Assessment (PRA) Peer Review Process Guidance,” NEI 00-02, Revision 1, dated May 2006 (ADAMS Accession No. ML061510623).

13. Nuclear Energy Institute, “Process for Performing Internal Events PRA Peer Reviews Using the ASME/ANS PRA Standard,” NEI 05-04, Revision 2, dated November 2008 (ADAMS Accession No. ML083430462).

14. U.S. Nuclear Regulatory Commission, “Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities - 10 CFR 50.54(f),” Generic Letter No. 88-20, Supplement 4, dated June 28, 1991 (ADAMS Accession No. ML031150485).

15. Electric Power Research Institute, “Fire-Induced Vulnerability Evaluation (FIVE),” TR-100370 September 1993.

16. Smith R. A., Wolf Creek Nuclear Operating Corporation, letter to U.S. Nuclear Regulatory Commission, “Docket No. 50-482 - Wolf Creek Nuclear Operating Corporation’s Seismic Hazard and Screen Report (CEUS Sites), Response NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident,” March 31, 2014 (ADAMS Accession No. ML14097A020).

17. Broschak, J. P., Wolf Creek Nuclear Operating Corporation, letter to U.S. Nuclear Regulatory Commission, “Docket No. 50-482: Wolf Creek Nuclear Operating Corporation’s Flood Hazard Reevaluation Report in Response to NRC Request for Information Regarding Recommendation 2.1, Flooding, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident,” dated March 10, 2014 and Flood Hazard Reevaluation Report, Revision 0, dated February 10, 2014 (ADAMS Accession No. ML14077A280 and ML14077A281, respectively).

18. Nuclear Management Resources Council “Guidelines for Industry Actions to Assess Shutdown Management,” NUMARC 91-06, dated December 1991 (ADAMS Accession No. ML14365A203).

19. Brookhaven National Laboratory, Avaplan Oy, and Science Applications International Corporation, “Handbook of Methods for Risk-Based Analyses of Technical Specifications,” NUREG/CR-6141, dated December 1994 (ADAMS Accession No. ML093090361).

20. U.S. Nuclear Regulatory Commission, NUREG/CR-5497, “Common-Cause Failure Parameter Estimations,” October 1998 (ADAMS Accession No. ML070580356).

21. Bowman, E. E., U.S. Nuclear Regulatory Commission, letter to Technical Specifications Task Force, “Notification of Issue with NRC-Approved Technical Specifications Task Force (TSTF) Traveler TSTF-425, Revision 3, ‘Relocate Surveillance Frequencies to Licensee Control - RITSTF Initiative 5b,’” dated April 14, 2010 (ADAMS Accession No. ML100990099).

22. Singal, B. K., U.S. Nuclear Regulatory Commission, letter to Muench, R. A., Wolf Creek Nuclear Operating Corporation, “Wolf Creek Generating Station – Issuance of Amendment Re: Application to Revise Technical Specifications Regarding Control Room Envelope Habitability in Accordance with TSTF-448, Revision 3 (Tac No. MD7791),” dated December 24, 2008 (ADAMS Accession No. ML083390833).

Principal Contributors: C. Moulton
D. Wu
J. Circle
T. Sweat

Date: April 8, 2021

SUBJECT: WOLF CREEK GENERATING STATION, UNIT 1 - ISSUANCE OF AMENDMENT NO. 227 RE: TECHNICAL SPECIFICATION CHANGE REGARDING RISK-INFORMED JUSTIFICATION FOR THE RELOCATION OF SPECIFIC SURVEILLANCE FREQUENCY REQUIREMENTS TO A LICENSEE CONTROLLED PROGRAM BASED ON TSTF-425 (EPID L-2020-LLA-0091) DATED APRIL 8, 2021

DISTRIBUTION:

PUBLIC
PM File Copy
RidsACRS_MailCTRResource
RidsNrrDexEeeb Resource
RidsNrrDexEseb Resource
RidsNrrDexEmib Resource
RidsNrrDnrlNcsg Resource
RidsNrrDorlLpl4 Resource
RidsNrrDraAplb Resource
RidsNrrDraArcb Resource
RidsNrrDssScpb Resource
RidsNrrDssSnsb Resource
RidsNrrDssStsb Resource
RidsNrrLAPBlechman Resource
RidsNrrPMWolfCreek Resource
RidsRgn4MailCenter Resource
CMoulton, NRR
DWu, NRR
JCircle, NRR
AChereskin, NRR
EKleeh, NRR
FForsaty, NRR
GSingh, NRR
ITseng, NRR
MYoder, NRR
NKaripineni, NRR
RHernandez-Figueroa, NRR
TSweat, NRR
WGardner, NRR

ADAMS Accession No. ML21053A117

OFFICE	NRR/DORL/LPL4/PM	NRR/DORL/LPL4/LA	NRR/DSS/STSB/BC
NAME	SLee	PBlechman	VCusumano
DATE	03/29/2021	03/29/2021	02/17/2021
OFFICE	NRR/DRA/APLB/BC(A)	NRR/DEX/EEEB/BC	NRR/DEX/EMIB/BC
NAME	SVasavada	BTitus	ABuford (TScarbrough for)
DATE	12/11/2020	01/22/2021	02/11/2021
OFFICE	NRR/DSS/SCPB/BC	NRR/DSS/SNSB/BC	NRR/DNRL/NCSG/BC
NAME	BWittick	SKrepel	SBloom
DATE	02/02/2021	01/22/2021	01/22/2021
OFFICE	OGC	NRR/DORL/LPL4/BC	NRR/DORL/LPL4/PM
NAME	AGhoshNaber	JDixon-Herrity	SLee
DATE	03/24/2021	04/08/2021	04/08/2021

OFFICIAL RECORD COPY