



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

July 28, 2015

Mr. Adam C. Heflin
President, Chief Executive Officer,
and Chief Nuclear Officer
Wolf Creek Nuclear Operating Corporation
P.O. Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION - ISSUANCE OF AMENDMENT RE:
ADOPT TSTF-523, REVISION 2, "GENERIC LETTER 2008-01, MANAGING
GAS ACCUMULATION" (TAC NO. MF5280)

Dear Mr. Heflin:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 212 to Renewed Facility Operating License No. NPF-42 for the Wolf Creek Generating Station. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated November 20, 2014, as supplemented by letters dated March 18 and May 4, 2015.

The amendment revises the TS requirements to address NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," as described in Technical Specification Task Force (TSTF) Traveler TSTF-523, Revision 2, "Generic Letter 2008-01, Managing Gas Accumulation."

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

Sincerely,

A handwritten signature in black ink, appearing to read "C. F. Lyon", is positioned below the word "Sincerely,".

Carl F. Lyon, Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosures:

1. Amendment No. 212 to NPF-42
2. Safety Evaluation

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

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 212
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 (the facility) Renewed Facility Operating License No. NPF-42 filed by the Wolf Creek Nuclear Operating Corporation (the Corporation), dated November 20, 2014, as supplemented by letters dated March 18 and May 4, 2015, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 2.C.(2) of 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. 212, 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



Michael T. Markley, Chief
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Date of Issuance: July 28, 2015

ATTACHMENT TO LICENSE AMENDMENT NO. 212

RENEWED FACILITY OPERATING LICENSE NO. NPF-42

DOCKET NO. 50-482

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

Renewed Facility Operating License

REMOVE

INSERT

4

4

Technical Specifications

REMOVE

INSERT

ii

ii

3.4-13 to 3.4-44

3.4-13 to 3.4-45

3.5-4

3.5-4

3.6-17 to 3.6-20

3.6-17 to 3.6-21

3.9-8

3.9-8

3.9-10

3.9-10

- (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. 212, 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

3.3	INSTRUMENTATION (continued)	
3.3.6	Containment Purge Isolation Instrumentation	3.3-45
3.3.7	Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation	3.3-49
3.3.8	Emergency Exhaust System (EES) Actuation Instrumentation	3.3-54
3.4	REACTOR COOLANT SYSTEM (RCS).....	3.4-1
3.4.1	RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits	3.4-1
3.4.2	RCS Minimum Temperature for Criticality	3.4-5
3.4.3	RCS Pressure and Temperature (P/T) Limits	3.4-6
3.4.4	RCS Loops - MODES 1 and 2	3.4-8
3.4.5	RCS Loops - MODE 3.....	3.4-9
3.4.6	RCS Loops - MODE 4.....	3.4-12
3.4.7	RCS Loops - MODE 5, Loops Filled	3.4-15
3.4.8	RCS Loops - MODE 5, Loops Not Filled	3.4-18
3.4.9	Pressurizer	3.4-20
3.4.10	Pressurizer Safety Valves	3.4-22
3.4.11	Pressurizer Power Operated Relief Valves (PORVs).....	3.4-24
3.4.12	Low Temperature Overpressure Protection (LTOP) System	3.4-27
3.4.13	RCS Operational LEAKAGE	3.4-32
3.4.14	RCS Pressure Isolation Valve (PIV) Leakage	3.4-34
3.4.15	RCS Leakage Detection Instrumentation	3.4-38
3.4.16	RCS Specific Activity.....	3.4-42
3.4.17	Steam Generator (SG) Tube Integrity.....	3.4-44
3.5	EMERGENCY CORE COOLING SYSTEMS (ECCS).....	3.5-1
3.5.1	Accumulators	3.5-1
3.5.2	ECCS - Operating	3.5-3
3.5.3	ECCS - Shutdown	3.5-6
3.5.4	Refueling Water Storage Tank (RWST).....	3.5-8
3.5.5	Seal Injection Flow	3.5-10
3.6	CONTAINMENT SYSTEMS	3.6-1
3.6.1	Containment.....	3.6-1
3.6.2	Containment Air Locks.....	3.6-2
3.6.3	Containment Isolation Valves	3.6-7
3.6.4	Containment Pressure	3.6-14
3.6.5	Containment Air Temperature	3.6-15
3.6.6	Containment Spray and Cooling Systems	3.6-16
3.6.7	Spray Additive System	3.6-20

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	<p>A.2 -----NOTE----- Only required if one RHR loop is OPERABLE. -----</p> <p>Be in MODE 5.</p>	24 hours
<p>B. Required loops inoperable.</p> <p><u>OR</u></p> <p>No RCS or RHR loop in operation.</p>	<p>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.</p> <p><u>AND</u></p> <p>B.2 Initiate action to restore one loop to OPERABLE status and operation.</p>	<p>Immediately</p> <p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.6.1 Verify one RHR or RCS loop is in operation.	12 hours
SR 3.4.6.2 Verify SG secondary side narrow range water levels are $\geq 6\%$ for required RCS loops.	12 hours
SR 3.4.6.3 Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	7 days

(continued) |

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.6.4	<p>-----NOTE-----</p> <p>Not required to be performed until 12 hours after entering MODE 4.</p> <p>-----</p> <p>Verify required RHR loop locations susceptible to gas accumulation are sufficiently filled with water.</p>	31 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.7 RCS Loops - MODE 5, Loops Filled

LCO 3.4.7 One residual heat removal (RHR) loop shall be OPERABLE and in operation, and either:

- a. One additional RHR loop shall be OPERABLE; or
- b. The secondary side wide range water level of at least two steam generators (SGs) shall be $\geq 66\%$.

NOTES

1. The RHR pump of the loop in operation may be removed from operation for ≤ 1 hour per 8 hour period provided:
 - a. No operations are permitted 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. Core outlet temperature is maintained at least 10°F below saturation temperature.
 2. One required RHR loop may be inoperable for up to 2 hours for surveillance testing provided that the other RHR loop is OPERABLE and in operation.
 3. No reactor coolant pump shall be started with any RCS cold leg temperature $\leq 368^{\circ}\text{F}$ unless the secondary side water temperature of each SG is $\leq 50^{\circ}\text{F}$ above each of the RCS cold leg temperatures.
 4. All RHR loops may be removed from operation during planned heatup to MODE 4 when at least one RCS loop is in operation.
-

APPLICABILITY: MODE 5 with RCS loops filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHR loop inoperable. <u>AND</u> Required SGs secondary side water levels not within limits.	A.1 Initiate action to restore a second RHR loop to OPERABLE status.	Immediately
	<u>OR</u> A.2 Initiate action to restore required SG secondary side water levels to within limits.	Immediately
B. Required RHR loops inoperable. <u>OR</u> 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.	Immediately
	<u>AND</u> B.2 Initiate action to restore one RHR loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.7.1 Verify one RHR loop is in operation.	12 hours

(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.	12 hours
SR 3.4.7.3	Verify correct breaker alignment and indicated power are available to the required RHR pump that is not in operation.	7 days
SR 3.4.7.4	Verify required RHR loop locations susceptible to gas accumulation are sufficiently filled with water.	31 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.8 RCS Loops - MODE 5, Loops Not Filled

LCO 3.4.8 Two residual heat removal (RHR) loops shall be OPERABLE and one RHR loop shall be in operation.

NOTES

1. All RHR pumps may be removed from operation for ≤ 1 hour provided:
 - a. The core outlet temperature is maintained at least 10°F below saturation temperature;
 - b. No operations are permitted that would cause introduction into the RCS, coolant with boron concentration less than required to meet the SDM of LCO 3.1.1; and
 - c. Reactor vessel water level is above the vessel flange.
2. One RHR loop may be inoperable for ≤ 2 hours for surveillance testing provided that the other RHR loop is OPERABLE and in operation.

APPLICABILITY: MODE 5 with RCS loops not filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHR loop inoperable.	A.1 Initiate action to restore RHR loop to OPERABLE status.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required RHR loops inoperable. <u>OR</u> 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.	Immediately
	<u>AND</u> B.2 Initiate action to restore one RHR loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one RHR loop is in operation.	12 hours
SR 3.4.8.2	Verify correct breaker alignment and indicated power are available to the required RHR pump that is not in operation.	7 days
SR 3.4.8.3	Verify RHR loop locations susceptible to gas accumulation are sufficiently filled with water.	31 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.9 Pressurizer

- LCO 3.4.9 The pressurizer shall be OPERABLE with:
- a. Pressurizer water level $\leq 92\%$; and
 - b. Two groups of backup pressurizer heaters OPERABLE with the capacity of each group ≥ 150 kW.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Pressurizer water level not within limit.	A.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	A.2 Fully insert all rods.	6 hours
	<u>AND</u>	
	A.3 Place Rod Control System in a condition incapable of rod withdrawal.	6 hours
	<u>AND</u>	
	A.4 Be in MODE 4.	12 hours

(continued)

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.	6 hours
	<u>AND</u> C.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify pressurizer water level is $\leq 92\%$.	12 hours
SR 3.4.9.2	Verify capacity of each required group of pressurizer heaters is ≥ 150 kW.	18 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.10 Pressurizer Safety Valves

LCO 3.4.10 Three pressurizer safety valves shall be OPERABLE with lift settings ≥ 2411 psig and ≤ 2509 psig.

APPLICABILITY: MODES 1, 2, and 3.

NOTE

The lift settings are not required to be within the LCO limits during MODE 3 for the purpose of setting the pressurizer safety valves under ambient (hot) conditions. This exception is allowed for 54 hours following entry into MODE 3 provided a preliminary cold setting was made prior to heatup.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One pressurizer safety valve inoperable.	A.1 Restore valve to OPERABLE status.	15 minutes
B. Required Action and associated Completion Time not met. <u>OR</u> Two or more pressurizer safety valves inoperable.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	Verify each pressurizer safety valve is OPERABLE in accordance with the Inservice Testing Program. Following testing, lift settings shall be within $\pm 1\%$ of 2460 psig.	In accordance with the Inservice Testing Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.11 Pressurizer Power Operated Relief Valves (PORVs)

LCO 3.4.11 Each PORV and associated block valve shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with all RCS cold leg temperatures > 368°F.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more PORVs inoperable and capable of being manually cycled.	A.1 Close and maintain power to associated block valve.	1 hour
B. One PORV inoperable and not capable of being manually cycled.	B.1 Close associated block valve.	1 hour
	<u>AND</u>	
	B.2 Remove power from associated block valve.	1 hour
	<u>AND</u>	
	B.3 Restore PORV to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One block valve inoperable.	<p>-----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. -----</p>	
	C.1 Place associated PORV in manual control.	1 hour
	<p><u>AND</u></p> <p>C.2 Restore block valve to OPERABLE status.</p>	72 hours
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 Be in MODE 3.	6 hours
	<p><u>AND</u></p> <p>D.2 Be in MODE 4.</p>	12 hours
E. Two PORVs inoperable and not capable of being manually cycled.	E.1 Close associated block valves.	1 hour
	<u>AND</u>	
	E.2 Remove power from associated block valves.	1 hour
	<u>AND</u>	
	E.3 Be in MODE 3.	6 hours
	<u>AND</u>	
	E.4 Be in MODE 4.	12 hours

(continued)

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.	1 hour
	<u>AND</u> F.2 Restore one block valve to OPERABLE status.	2 hours
G. Required Action and associated Completion Time of Condition F not met.	G.1 Be in MODE 3.	6 hours
	<u>AND</u> G.2 Be in MODE 4.	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.	92 days
SR 3.4.11.2 Perform a complete cycle of each PORV.	In accordance with the Inservice Testing Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Low Temperature Overpressure Protection (LTOP) System

LCO 3.4.12

An LTOP System shall be OPERABLE with a maximum of zero safety injection pumps, one Emergency Core Cooling System (ECCS) centrifugal charging pump, and the normal charging pump capable of injecting into the RCS and the accumulators isolated and one of the following pressure relief capabilities:

- a. Two power operated relief valves (PORVs) with lift settings within the limits specified in the PTLR, or
- b. Two residual heat removal (RHR) suction relief valves with setpoints ≥ 436.5 psig and ≤ 463.5 psig, or
- c. One PORV with a lift setting within the limits specified in the PTLR and one RHR suction relief valve with a setpoint ≥ 436.5 psig and ≤ 463.5 psig, or
- d. The RCS depressurized and an RCS vent of ≥ 2.0 square inches.

NOTES

1. Two ECCS centrifugal charging pumps may be made capable of injecting for ≤ 1 hour for pump swap operation.
2. Two safety injection pumps and two ECCS centrifugal charging pumps may be made capable of injecting into the RCS: (a) in MODE 3 with any RCS cold leg temperature $\leq 368^{\circ}\text{F}$ and ECCS pumps OPERABLE pursuant to LCO 3.5.2, "ECCS - Operating," and (b) for up to 4 hours after entering MODE 4 from MODE 3 or until the temperature of one or more RCS cold leg decreases below 325°F , whichever comes first.
3. One or more safety injection pumps may be made capable of injecting into the RCS in MODES 5 and 6 when the RCS water level is below the top of the reactor vessel flange for the purpose of protecting the decay heat removal function.
4. Accumulator may be unisolated when accumulator pressure is less than the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.

APPLICABILITY: MODE 3, with any RCS cold leg temperature $\leq 368^{\circ}\text{F}$,
MODE 4,
MODE 5,
MODE 6 when the reactor vessel head is on.

ACTIONS

NOTE
LCO 3.0.4b. is not applicable when entering MODE 4 or MODE 3.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more safety injection pumps capable of injecting into the RCS.	A.1 Initiate action to verify a maximum of zero safety injection pumps are capable of injecting into the RCS.	Immediately
B. Two ECCS centrifugal charging pumps capable of injecting into the RCS.	B.1 Initiate action to verify a maximum of one ECCS centrifugal charging pump and the normal charging pump capable of injecting into the RCS.	Immediately
C. An accumulator not isolated when the accumulator pressure is greater than or equal to the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.	C.1 Isolate affected accumulator.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1 Increase all RCS cold leg temperatures to > 368°F.	12 hours
	<u>OR</u> D.2 Depressurize affected accumulator to less than the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.	12 hours
E. One required RCS relief valve inoperable in MODE 3 or MODE 4.	E.1 Restore required RCS relief valve to OPERABLE status.	7 days
F. One required RCS relief valve inoperable in MODE 5 or 6.	F.1 Restore required RCS relief valve to OPERABLE status.	24 hours
G. Two required RCS relief valves inoperable. <u>OR</u> Required Action and associated Completion Time of Condition A, B, D, E, or F not met. <u>OR</u> LTOP System inoperable for any reason other than Condition A, B, C, D, E, or F.	G.1 Depressurize RCS and establish RCS vent of ≥ 2.0 square inches.	8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Verify a maximum of zero safety injection pumps are capable of injecting into the RCS.	12 hours
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.	12 hours
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.	12 hours
SR 3.4.12.4	Verify RHR suction isolation valves are open for each required RHR suction relief valve.	72 hours
SR 3.4.12.5	Verify required RCS vent ≥ 2.0 square inches open.	12 hours for vent pathway(s) not locked, sealed or otherwise secured in the open position <u>AND</u> 31 days for vent valve(s) locked, sealed or otherwise secured in the open position

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.6	Verify PORV block valve is open for each required PORV.	72 hours
SR 3.4.12.7	Not Used.	
SR 3.4.12.8	<p>-----NOTE-----</p> <p>Not required to be performed until 12 hours after decreasing any RCS cold leg temperature to $\leq 368^{\circ}\text{F}$.</p> <hr/> <p>Perform a COT on each required PORV, excluding actuation.</p>	31 days
SR 3.4.12.9	Perform CHANNEL CALIBRATION for each required PORV actuation channel.	18 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.13 RCS Operational LEAKAGE

LCO 3.4.13 RCS operational LEAKAGE shall be limited to:

- a. No pressure boundary LEAKAGE;
- b. 1 gpm unidentified LEAKAGE;
- c. 10 gpm identified LEAKAGE; and
- d. 150 gallons per day primary to secondary LEAKAGE through any one steam generator (SG).

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCS operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE.	A.1 Reduce LEAKAGE to within limits.	4 hours
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> Pressure boundary LEAKAGE exists. <u>OR</u> Primary to secondary LEAKAGE not within limit.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.13.1	<p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. Not required to be performed until 12 hours after establishment of steady state operation. 2. Not applicable to primary to secondary LEAKAGE. 	72 hours
	<p>Verify RCS operational LEAKAGE is within limits by performance of RCS water inventory balance.</p>	
SR 3.4.13.2	<p>-----NOTE-----</p> <p>Not required to be performed until 12 hours after establishment of steady state operation.</p>	72 hours
	<p>Verify primary to secondary LEAKAGE is ≤ 150 gallons per day through any one SG.</p>	

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.14 RCS Pressure Isolation Valve (PIV) Leakage

LCO 3.4.14 Leakage from each RCS PIV shall be within limit.

APPLICABILITY: MODES 1, 2, and 3,
 MODE 4, except valves in the residual heat removal (RHR) flow path
 when in, or during the transition to or from, the RHR mode of
 operation.

ACTIONS

NOTES

1. Separate Condition entry is allowed for each flow path.
2. Enter applicable Conditions and Required Actions for systems made inoperable by an inoperable PIV.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more flow paths with leakage from one or more RCS PIVs not within limit.	<p>-----NOTE-----</p> <p>Each valve used to satisfy Required Action A.1 must have been verified to meet SR 3.4.14.1 and be in the reactor coolant pressure boundary.</p> <p>-----</p>	
	<p>A.1 Isolate the high pressure portion of the affected system from the low pressure portion by use of one deactivated remote manual or check valve.</p>	4 hours
	<p><u>AND</u></p> <p>A.2. Restore RCS PIV to within limits.</p>	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time for Condition A not met.	B.1 Be in MODE 3.	6 hours
	<u>AND</u> B.2 Be in MODE 5.	36 hours
C. RHR suction isolation valve interlock function inoperable.	C.1 Isolate the affected penetration by use of one deactivated remote manual valve.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.4.14.1</p> <hr/> <p style="text-align: center;">NOTES</p> <hr/> <ol style="list-style-type: none"> 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. <hr/> <p>Verify leakage from each RCS PIV is equivalent to ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm at an RCS pressure ≥ 2215 psig and ≤ 2255 psig.</p>	<p>In accordance with the Inservice Testing Program, and 18 months</p> <p><u>AND</u></p> <p>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</p> <p><u>AND</u></p> <p>Within 24 hours following check valve actuation due to flow through the valve</p>

(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 ≥ 425 psig except when the valves are open to satisfy LCO 3.4.12.	18 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.15 RCS Leakage Detection Instrumentation

LCO 3.4.15 The following RCS leakage detection instrumentation shall be OPERABLE:

- a. The containment sump level and flow monitoring system;
- b. One containment atmosphere particulate radioactivity monitor; and
- c. One containment air cooler condensate monitoring system.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required containment sump level and flow monitoring system inoperable.	A.1 <u>-----NOTE-----</u> Not required until 12 hours after establishment of steady state operation. <u>-----</u>	
	Perform SR 3.4.13.1.	Once per 24 hours
	<u>AND</u>	<u>-----NOTE-----</u> The Completion Time is extended beyond the 30 days until startup from a plant shutdown or startup from Refueling Outage 20. <u>-----</u>
	A.2 Restore required containment sump level and flow monitoring system to OPERABLE status.	30 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required containment atmosphere particulate radioactivity monitor inoperable.	B.1.1 Analyze samples of the containment atmosphere.	Once per 24 hours
	<u>OR</u>	
	B.1.2 -----NOTE----- Not required until 12 hours after establishment of steady state operation. -----	Once per 24 hours
	Perform SR 3.4.13.1.	
	<u>AND</u>	
	B.2.1 Restore required containment atmosphere particulate radioactivity monitor to OPERABLE status.	30 days
	<u>OR</u>	
	B.2.2 Verify containment air cooler condensate monitoring system is OPERABLE.	30 days
C. Required containment cooler condensate monitoring system inoperable.	C.1 Perform SR 3.4.15.1.	Once per 8 hours
	<u>OR</u>	
	C.2 -----NOTE----- Not required until 12 hours after establishment of steady state operation. -----	Once per 24 hours
	Perform SR 3.4.13.1.	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>D. Required containment atmosphere particulate radioactivity monitor inoperable.</p> <p><u>AND</u></p> <p>Required containment cooler condensate monitoring system inoperable.</p>	<p>D.1 Restore required containment atmosphere particulate radioactivity monitor to OPERABLE status.</p>	30 days
	<p><u>OR</u></p> <p>D.2 Restore required containment cooler condensate monitoring system to OPERABLE status.</p>	30 days
<p>E. Required Action and associated Completion Time not met.</p>	<p>E.1 Be in MODE 3.</p>	6 hours
	<p><u>AND</u></p> <p>E.2 Be in MODE 5.</p>	36 hours
F. All required monitoring methods inoperable.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere particulate radioactivity monitor.	12 hours
SR 3.4.15.2	Perform COT of the required containment atmosphere particulate radioactivity monitor.	92 days
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the required containment sump level and flow monitoring system.	18 months
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere particulate radioactivity monitor.	18 months
SR 3.4.15.5	Perform CHANNEL CALIBRATION of the required containment cooler condensate monitoring system.	18 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.16 RCS Specific Activity

LCO 3.4.16 RCS DOSE EQUIVALENT I-131 and DOSE EQUIVALENT XE-133 specific activity shall be within limits.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DOSE EQUIVALENT I-131 not within limit.	-----NOTE----- LCO 3.0.4c. is applicable. -----	
	A.1 Verify DOSE EQUIVALENT I-131 $\leq 60 \mu\text{Ci/gm.}$	Once per 4 hours
	<u>AND</u> A.2 Restore DOSE EQUIVALENT I-131 to within limit.	48 hours
B. DOSE EQUIVALENT XE-133 not within limit.	-----NOTE----- LCO 3.0.4c. is applicable. -----	
	B.1 Restore DOSE EQUIVALENT XE-133 to within limit.	48 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met. <u>OR</u> DOSE EQUIVALENT I-131 > 60 $\mu\text{Ci/gm.}$	C.1 Be in MODE 3.	6 hours
	AND	
	C.2 Be in MODE 5.	36 hours

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 $\leq 500 \mu\text{Ci/gm.}$	7 days
SR 3.4.16.2 -----NOTE----- Only required to be performed in MODE 1. ----- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity $\leq 1.0 \mu\text{Ci/gm.}$	14 days <u>AND</u> Between 2 and 6 hours after a THERMAL POWER change of $\geq 15\%$ RTP within a 1 hour period

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.17 Steam Generator (SG) Tube Integrity

LCO 3.4.17 SG tube integrity shall be maintained.

AND

All SG tubes satisfying the tube plugging criteria shall be plugged in accordance with the Steam Generator Program.

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

ACTIONS

NOTE

Separate Condition entry is allowed for each SG tube.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more SG tubes satisfying the tube plugging criteria and not plugged in accordance with the Steam Generator Program.	A.1 Verify tube integrity of the affected tube(s) is maintained until the next refueling outage or SG tube inspection.	7 days
	<u>AND</u> A.2 Plug the affected tube(s) in accordance with the Steam Generator Program.	Prior to entering MODE 4 following the next refueling outage or SG tube inspection
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> SG tube integrity not maintained.	B.1 Be in MODE 3.	6 hours
	<u>AND</u> B.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.17.1	Verify SG tube integrity in accordance with the Steam Generator Program.	In accordance with the Steam Generator Program
SR 3.4.17.2	Verify that each inspected SG tube that satisfies the tube plugging criteria is plugged in accordance with the Steam Generator Program.	Prior to entering MODE 4 following a SG tube inspection

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY																								
SR 3.5.2.1	<p>Verify the following valves are in the listed position with power to the valve operator removed.</p> <table> <tr> <th><u>Number</u></th><th><u>Position</u></th><th><u>Function</u></th></tr> <tr> <td>BN HV-8813</td><td>Open</td><td>Safety Injection to RWST Isolation Valve</td></tr> <tr> <td>EM HV-8802A</td><td>Closed</td><td>SI Hot Legs 2 & 3 Isolation Valve</td></tr> <tr> <td>EM HV-8802B</td><td>Closed</td><td>SI Hot Legs 1 & 4 Isolation Valve</td></tr> <tr> <td>EM HV-8835</td><td>Open</td><td>Safety Injection Cold Leg Isolation Valve</td></tr> <tr> <td>EJ HV-8840</td><td>Closed</td><td>RHR/SI Hot Leg Recirc Isolation Valve</td></tr> <tr> <td>EJ HV-8809A</td><td>Open</td><td>RHR to Accum Inject Loops 1 & 2 Isolation Valve</td></tr> <tr> <td>EJ HV-8809B</td><td>Open</td><td>RHR to Accum Inject Loops 3 & 4 Isolation Valve</td></tr> </table>	<u>Number</u>	<u>Position</u>	<u>Function</u>	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	12 hours
<u>Number</u>	<u>Position</u>	<u>Function</u>																								
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																								
SR 3.5.2.2	<p>-----NOTE----- Not required to be met for system vent flow paths opened under administrative control.</p> <p>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.</p>	31 days																								
SR 3.5.2.3	Verify ECCS locations susceptible to gas accumulation are sufficiently filled with water.	92 days																								
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)

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. <u>AND</u> E.2 Be in MODE 5.	6 hours 36 hours
F. Two containment spray trains inoperable. <u>OR</u> Any combination of three or more trains inoperable.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.6.6.1</p> <p style="text-align: center;"><u>NOTE</u></p> <p>Not required to be met for system vent flow paths opened under administrative control.</p> <hr/> <p>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.</p>	31 day

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6.2	Operate each containment cooling train fan unit for ≥ 15 minutes.	31 days
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.	18 months
SR 3.6.6.6	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	18 months
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.	18 months
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.	92 days

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.	6 hours
	<u>AND</u> B.2 Be in MODE 5.	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.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.7.2	Verify spray additive tank solution volume is ≥ 4340 gal and ≤ 4540 gal.	184 days
SR 3.6.7.3	Verify spray additive tank solution concentration is $\geq 28\%$ and $\leq 31\%$ by weight.	184 days
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.	18 months
SR 3.6.7.5	Verify spray additive flow rate from each solution's flow path.	5 years

RHR and Coolant Circulation - High Water Level
3.9.5

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 ≥ 1000 gpm.	12 hours
SR 3.9.5.2	Verify required RHR loop locations susceptible to gas accumulation are sufficiently filled with water.	31 days

RHR and Coolant Circulation - Low Water Level
3.9.6

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2 Initiate action to restore one RHR loop to operation.	Immediately
	<u>AND</u> 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 ≥ 1000 gpm.	12 hours
SR 3.9.6.2	Verify correct breaker alignment and indicated power available to the required RHR pump that is not in operation.	7 days
SR 3.9.6.3	Verify RHR loop locations susceptible to gas accumulation are sufficiently filled with water.	31 days



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 212 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-42

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

1.0 INTRODUCTION

By application dated November 20, 2014, as supplemented by letters dated March 18 and May 4, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML14330A247, ML15084A104, and ML15132A651, respectively), Wolf Creek Nuclear Operating Corporation (WCNOC, the licensee) requested changes to the Technical Specifications (TSs) for Wolf Creek Generating Station (WCGS). The supplemental letters dated March 18 and May 4, 2015, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on March 31, 2015 (80 FR 17105).

The proposed changes would revise the TS requirements to address NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," as described in Technical Specification Task Force (TSTF) Traveler TSTF-523, Revision 2, "Generic Letter 2008-01, Managing Gas Accumulation" (ADAMS Accession No. ML13053A075). WCNOC's application was consistent with the NRC-approved safety evaluation for TSTF-523, Revision 2, as published in the Notice of Availability in the *Federal Register* on January 15, 2014 (79 FR 2700), "TSTF-523, 'Generic Letter 2008-01, Managing Gas Accumulation,' Using the Consolidated Line Item Improvement Process," with the exception of a proposed surveillance requirement (SR) frequency. Specifically, WCNOC proposed a surveillance frequency of 92 days for the modified SR 3.5.2.3, "Verify ECCS (Emergency Core Cooling System) locations susceptible to gas accumulation are sufficiently filled with water." WCNOC also proposed adding a new SR 3.6.6.9, "Verify containment spray locations susceptible to gas accumulation are sufficiently filled with water," with a frequency of 92 days. These SR frequencies differ from with the 31-day frequency that was specified in TSTF-523, Revision 2.

Plants typically are designed and licensed so that systems, such as the ECCS and the residual heat removal system (RHR), are to be in a water-solid condition. Consequently, for most licensees, including WCNO, whether stated or not, the current design basis for the subject systems is a water-solid condition. This was reiterated in Nuclear Energy Institute (NEI) 09-10, Revision 1a-A, "Guidelines for Effective Prevention and Management of System Gas Accumulation," April 2013 (ADAMS Accession No. ML13136A129), which states, in part, that "If there is no specified design limit, then the design limit is no gas present." This means the subject systems must be water-solid when transitioning from an outage into power operation. Once the transition is complete, voids are acceptable in recognition of the possibility that voids may form during operation provided operability is reasonably maintained and the voids are removed as soon as is practical. This is consistent with the NRC staff's position in "Task Interface Agreement - Emergency Core Cooling Systems (ECCS) Voiding Relative to Compliance with Surveillance Requirements (SR) 3.0.1.1, 3.5.2.3, and 3.5.3.1 (TIA 2008-03)," dated October 21, 2008 (ADAMS Accession No. ML082560209), which stated that system piping can be considered filled with water if system operability has been established.

2.0 REGULATORY EVALUATION

2.1 Background

Gas accumulation in reactor systems can result in water hammer, pump cavitation, and pumping of non-condensable gas into the reactor vessel. These effects may result in the subject system being unable to perform its specified safety function. The NRC issued Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," in January 2008 to address the issue of gas accumulation in ECCS, DHR, and CS systems (ADAMS Accession No. ML072910759). The industry and NRC staff agreed that a change to the Standard Technical Specifications and plant-specific TS would be necessary to address some issues discussed in GL 2008-01. TSTF-523 contains changes to the TS SRs and TS Bases to address some of the concerns in GL 2008-01. The licensee proposed amending the WCGS TS using a plant-specific adoption of the TSTF-523 changes.

2.2 Technical Specification Changes

Changes were proposed for SRs 3.5.2.2, 3.5.2.3, 3.6.6.1, as well as the addition of new SRs 3.4.6.4, 3.4.7.4, 3.4.8.3, 3.6.6.9, 3.9.5.2, and 3.9.6.3 to TS 3.4.6, "RCS Loops - MODE 4," TS 3.4.7, "RCS Loops - MODE 5, Loops Filled," TS 3.4.8, "RCS Loops - MODE 5, Loops Not Filled," TS 3.5.2, "ECCS - Operating," TS 3.6.6, "Containment Spray and Cooling Systems," TS 3.9.5, "RHR and Coolant Circulation - High Water Level," and TS 3.9.6, "RHR and Coolant Circulation - Low Water Level," respectively.

The licensee proposed a variation in the numbering scheme from that provided in TSTF-523. The licensee proposed the addition of SR 3.6.6.9 to TS 3.6.6, whereas the TSTF inserted the corresponding SR as 3.6.6.A.4 and renumbers the remaining SRs accordingly. This change is administrative in nature.

2.3 Regulatory Review

The regulations in Appendix A to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 provide general design requirements for nuclear power plants. As documented in the WCGS Updated Safety Analysis Report, Section 3.1, WCGS is designed in accordance with Appendix A. Appendix B to 10 CFR Part 50, the TSs, and the licensee quality assurance programs provide operating requirements. The regulatory requirements of 10 CFR Part 50, Appendix A, that are applicable to gas management in the subject systems include: General Design Criteria (GDC) 1, 34, 35, 36, 37, 38, 39 and 40. GDC 1 requires that structures, systems and components (SSCs) be designed, fabricated, erected, and tested to quality standards commensurate with their importance to safety. GDC 34 requires an RHR system designed to maintain specified acceptable fuel design limits and to meet design conditions that are not exceeded if a single failure occurs and specified electrical power systems fail. GDC 35, 36, and 37 require an ECCS design that meets performance, inspection, and testing requirements. Additionally, the regulations in 10 CFR 50.46 provide specified ECCS performance criteria. GDC 38, 39, and 40 require a containment heat removal system design that meets performance, inspection, and testing requirements.

Quality assurance criteria provided in 10 CFR Part 50, Appendix B, that apply to gas management in the subject systems include: Criteria III, V, XI, XVI, and XVII. Criteria III and V require measures to ensure that applicable regulatory requirements and the design basis, as defined in 10 CFR 50.2, "Definitions," and as specified in the license application, are correctly translated into controlled specifications, drawings, procedures, and instructions. Criterion XI requires a test program to ensure that the subject systems will perform satisfactorily in service and requires that test results shall be documented and evaluated to ensure that test requirements have been satisfied. Criterion XVI requires measures to ensure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances, are promptly identified and corrected, and that significant conditions adverse to quality are documented and reported to management. Criterion XVII requires maintenance of records of activities affecting quality.

The NRC's regulatory requirements related to the content of the TSs are contained in 10 CFR 50.36(c). The regulations at 10 CFR 50.36 require that the TSs include items in the following categories: (1) safety limits, limiting safety systems settings, and limiting control settings; (2) limiting conditions for operation (LCO); (3) SRs; (4) design features; and (5) administrative controls. SRs 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 LCOs will be met. Typically, TS Section 5 requires that licensees establish, implement, and maintain written procedures covering the applicable procedures recommended in Appendix A to Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements (Operation)." Appendix A to RG 1.33 identifies instructions for filling and venting the ECCS and DHR system, as well as for draining and refilling heat exchangers. Standard TSs and most licensee TSs include SRs to verify that at least some of the subject systems piping is filled with water.

The NRC's guidance for the format and content of licensee TSs can be found in NUREG-1431, "Standard Technical Specifications Westinghouse Plants".

Regulatory guidance for the NRC staff's review of containment heat removal systems, ECCS, and RHR systems is provided in the following revisions and sections of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition" (SRP).

- Revision 3 of SRP, Section 6.2.2, "Containment Heat Removal Systems," March 2007 (ADAMS Accession No. ML070160661), provides the procedures concerning the review of containment heat removal under post-accident conditions to help ensure compliance with GDC 38, 39, and 40.
- Revision 3 of SRP, Section 6.3, "Emergency Core Cooling System," March 2007 (ADAMS Accession No. ML070550068), provides the procedures concerning the review of ECCS to help ensure compliance with GDC 35, 36, and 37.
- Revision 5 of SRP, Section 5.4.7, "Residual Heat Removal (RHR) System," May 2010 (ADAMS Accession Number ML100680577), provides the procedures concerning the review of RHR system as it is used to cool the reactor coolant system (RCS) during and following shutdown to help ensure compliance with GDC 34.

3.0 TECHNICAL EVALUATION

The proposed change adopted the TS format and content, to the extent practicable, contained in the changes made to NUREG-1431, "Standard Technical Specifications Westinghouse Plants," by TSTF-523.

The NRC staff compared the proposed changes to the existing SRs, as well as the regulatory requirements of 10 CFR 50.36(c).

3.1 Licensee's Proposed TS Changes

TS Table of Contents

The starting page numbers were adjusted for the following TS entries on the table of contents, page ii:

- 3.4.8 - RCS Loops - MODE 5, Loops Not Filled
- 3.4.9 - Pressurizer
- 3.4.10 - Pressurizer Safety Valves
- 3.4.11 - Pressurizer Power Operated Relief Valves (PORVs)
- 3.4.12 - Low Temperature Overpressure Protection (LTOP) System
- 3.4.13 - RCS Operational LEAKAGE
- 3.4.14 - RCS Pressure Isolation Valve (PIV) Leakage
- 3.4.15 - RCS Leakage Detection Instrumentation
- 3.4.16 - RCS Specific Activity
- 3.4.17 - Steam Generator (SG) Tube Integrity
- 3.6.7 - Spray Additive System

TS 3.4.6 – RCS Loops – MODE 4

New SR 3.4.6.4, with a surveillance frequency of “31 days,” would state:

-----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.

TS 3.4.7 – RCS Loops – MODE 5, Loops Filled

New SR 3.4.7.4, with a surveillance frequency of “31 days,” would state:

Verify required RHR loop locations susceptible to gas accumulation are sufficiently filled with water.

TS 3.4.8 – RCS Loops – MODE 5, Loops Not Filled

New SR 3.4.8.3, with a surveillance frequency of “31 days,” would state:

Verify RHR loop locations susceptible to gas accumulation are sufficiently filled with water.

TS 3.5.2 – ECCS – Operating

Current SR 3.5.2.2 would be revised to add the following Note:

-----NOTE-----
Not required to be met for system vent flow paths opened under administrative control.

Current SR 3.5.2.3 states:

Verify ECCS piping is full of water.

Revised SR 3.5.2.3 would state:

Verify ECCS locations susceptible to gas accumulation are sufficiently filled with water.

In addition, the current SR 3.5.2.3 frequency of “31 days” would be changed to “92 days.”

TS 3.6.6 – Containment Spray and Cooling Systems

Current SR 3.6.6.1 would be revised to add the following Note:

-----NOTE-----
Not required to be met for system vent flow paths opened under administrative control.

New SR 3.6.6.9, with a surveillance frequency of “92 days,” would state:

Verify containment spray locations susceptible to gas accumulation are sufficiently filled with water.

TS 3.9.5 – RHR and Coolant Circulation – High Water Level

New SR 3.9.5.2, with a surveillance frequency of “31 days,” would state:

Verify required RHR loop locations susceptible to gas accumulation are sufficiently filled with water.

TS 3.9.6 – RHR and Coolant Circulation – Low Water Level

New SR 3.9.6.3, with a surveillance frequency of “31 days,” would state:

Verify RHR loop locations susceptible to gas accumulation are sufficiently filled with water.

3.2 NRC Staff Evaluation

The new language for the SRs was developed using licensee responses to GL 2008-01 and the NRC discussion contained in Task Interface Agreement (TIA) 2008-03, “Emergency Core Cooling System (ECCS) Voiding Relative To Compliance With Surveillance Requirements (SR) 3.5.1.1, 3.5.2.3, and 3.5.3.1” (ADAMS Accession No. ML082560209). Many of the GL 2008-01 responses stated that licensees identified system locations susceptible to gas accumulation. In the TIA, the NRC stated that the intent of the TS SRs, which state “full of water,” may be met if the licensee can establish, through an Operability Determination, that there is a reasonable expectation that the system in question will perform its specified safety function. Therefore the phrase, “sufficiently filled with water” was recommended for the proposed TS changes. In the TS, “sufficiently filled with water” is understood to mean “sufficiently filled with water to support Operability.” The regulation at 10 CFR 50.36(c)(3) states that one of the purposes of the SR is to verify that the LCO is met. Therefore, the new SR language, “Verify the [system name] locations susceptible to gas accumulation are sufficiently filled with water,” is acceptable since this language will allow the licensee to make a conclusion as to whether or not a system is operable.

The language for the notes that state that the SR does not have to be performed until 12 hours after entering Mode 4 for pressurized water reactors is acceptable because the note provides a

limited time to perform the Surveillance after entering the Applicability of the LCO; however, under the STS usage rules (STS Section 1.4), the requirement to manage gas accumulation is not affected. Licensees must have confidence that the SR can be met or the LCO must be declared not met.

The language for the notes that allow the SRs to not be met for system vent flow paths opened under administrative control is necessary to allow the licensee to credit administratively controlled manual action to close the system vent flow path in order to maintain system Operability during system venting and performance of the proposed gas accumulation SR. Therefore, these notes are acceptable.

The NRC staff found that the proposed SRs meet the regulatory requirements of 10 CFR 50.36 because they provide assurance that the necessary quality of systems and components will be maintained and that the LCO will be met.

WCNOC's November 20, 2014, license amendment request (LAR) is inconsistent with TSTF-523, Revision 2 in that for certain SRs, WCNOC proposes a 92 day frequency instead of a 31 day frequency. Specifically, WCNOC proposed a surveillance frequency of 92 days for the modified SR 3.5.2.3, "Verify ECCS (Emergency Core Cooling System) locations susceptible to gas accumulation are sufficiently filled with water." WCNOC also proposed adding a new SR 3.6.6.9, "Verify containment spray locations susceptible to gas accumulation are sufficiently filled with water," with a frequency of 92 days. WCNOC justified the proposed SR frequencies as follows:

- Potential leakage from the accumulators into the ECCS is continuously monitored.
- Volume control tank pressure is monitored to address potential gas formation in the centrifugal charging pump suctions.
- RCS leakage is addressed by performance of an RCS inventory balance every 72 hours (SR 3.4.14.1)
- RCS leakage into containment is addressed by monitoring containment sump level, containment radioactivity, and containment cooling equipment.
- RCS leakage into the ECCS and/or the RHR system is detected by an increase in system pressure. RHR system pressure is recorded once per shift.

The WCGS design basis for the ECCS and containment spray system is "no gas" with the exception of core spray discharge piping inside containment. There are 123 vent locations and 113 are vented followed by ultrasonic test (UT) to verify that the "water-solid" condition has been restored. UT is not qualified for ten of the locations. These are vented until a solid stream of water issues from the vent valve.

WCNOC stated in its application that its surveillance procedures require documenting whether a void or a water solid condition is found in the ECCS during performance of the SR. The licensee identified all instances of discovering a void during SRs performed during Cycles 17

through 20. In all instances, the licensee stated that a water solid condition was restored immediately or within a reasonable time from discovery of a void in the ECCS.

The licensee provided the following monitoring history in its letter dated May 4, 2015:

Cycle	Total locations monitored
17	1680
18	2331
19	2784
20	2328 (through 08/05/2014)

The licensee provided the following void discoveries applicable to SR 3.5.2.3 and 3.6.6.9 in its letter dated May 4, 2015:

Cycle	Location	Void / Allowable	As left	Approximate Days Since Last Listed Surveillance / TS Surveillance Frequency	Comments
16 ⁽¹⁾	See comments	--	See comments	--	Nine during refueling outage and startup. Seven left water-solid. One not vented (< 0.001 ft ³ with 0.25 ft ³ allowed). One partly vented (to << allowable 0.25 ft ³).
17	EJV0128	<<0.25 / 0.25	Solid	6 / 31	Increased surveillance during startup.
17	EVJ0223	0.13 / 0	Solid	17 / 31	Increased surveillance after startup.
17	EVJ0128	<<0.25 / 0.25	Solid	12 / 31	Source was degassing. Increased surveillance after startup.
17	EVJ0128	<<0.25 / 0.25	Solid	4 / 31	Source was degassing. Increased surveillance after startup.
17	EVJ0203	<<0.25 / 0.25	Solid	~21 / 31	Source was degassing. Increased surveillance after startup.
17	EMV02547	<<0.25 / 0.25	Solid	31 / 31	Leftover air from pre-startup.
17	ENV0117	~0.006	See comments	31 / 31	Small void after venting. Water-solid 6 days later.
17 ⁽¹⁾	--	--	Solid	--	Two during refueling outage and startup.
18	EJV0088	2.4	Solid	31 / 31	Follow-up concluded operability retained.
18	EJV0088	0.03	Solid	8 / 31	Follow-up for previous void.
18	EJV0088	0.02	Solid	7 / 31	Follow-up for previous void.
18	--	--	See comments	Abnormal RHR pump behavior over 2 days and over a day during vacuum fill and vent 50 days later / 31	Eleven voids from RHR heat exchanger. Three vented to small void, 3 to solid. One not vented; void gone in 2 days. One vented to small void; gone next day. Two exceeded acceptance criteria. Allowable heat exchanger void volume not determined; 6.2 ft ³ not swept out but later removed by vacuum fill and vent during an outage. Reasonable assurance stated that systems would have performed safety functions.
18	EJV0088	0.5	Solid	- / 31	Follow-up from accumulator level loss.

Cycle	Location	Void / Allowable	As left	Approximate Days Since Last Listed Surveillance / TS Surveillance Frequency	Comments
18	EJV0223	<0.001 / 0	Solid	31 / 31	
18	BGV0496	0.04	Solid	31 / 31	
18	ENV0117	6	See comments	92 / 92	Inoperable. Void vented to half of criterion. Water-solid next day.
18	ENV0093	0.02	See comments	92 / 92	Small void remained. Water-solid 4 days later.
18	ENV0093	<0.004	See comments	27 / 92	Could not be vented. Water-solid 36 days later.
19	ENV0120	1.1	Solid	92 / 92	Post discovery determined operability not lost.
19	ENV0120	0.28	Solid	44 / 92	
19	EJV0088	>0.59 / 0.59	Solid	6 hrs / 31	Accumulator level loss.
19	EJV0088	~1.12 max / 0.59	Solid	See comments / 31	Three instances over 9 days due to RCS leakage. Last one exceeded criterion; follow-up led to conclusion that safety function was not lost.
19	EJV0088	0.2	Solid	15 / 31	RCS leakage.
19	EJV0088	0.005	Solid	7 / 31	RCS leakage.
19	EMV0259	0.02	Solid	31 / 31	
19	EMV0058	0.04	See comments	NA	Post fill and vent following outage. Could not be vented. Water-solid a month later.
19 ⁽¹⁾	EMV0117	0.002	Solid	NA	Post fill and vent.
20	EMV0257	8	Solid	NA	Post fill and vent.

(1) Includes refueling outage at end of cycle.

In general, the water-solid criterion was restored whenever gas was found. This is consistent with the NRC staff approach that the water-solid condition should be restored at the earliest practical time following discovery of gas in applicable system piping. Multiple void discoveries during and immediately following an outage are an indication of assessing previous void removal actions. Discoveries following observed accumulator and RCS behavior show follow-up that does not depend on previously specified surveillances. The RHR pump abnormal behavior associated with the Cycle 18 EJV0088 void was not discovered by a 31-day SR and would not have been found by a 92-day SR. Eliminating these occurrences, the following remain:

Cycle	Location	Date	Void / Allowable	Approximate Days Since Last Listed Surveillance / TS Surveillance Frequency	Comments
18	EJV0088	04/14/10	2.4	31 / 31	Follow-up concluded operability retained. If void continued to grow at rate consistent with the 31-day surveillance, operability may have been lost with a 92-day SR.
18	ENV0117	07/06/10	6	92 / 92	Inoperable. Earlier surveillance may have prevented loss of operability.
19	ENV0120	12/03/12	1.1	92 / 92	Follow-up concluded operability retained.

The two most challenging cases with respect to a 92-day SR occurred 5 years ago. WCNOG stated that the one that occurred 3 years ago did not cause a loss of operability.

The licensee's 7-year history of 9123 surveillances involving 123 vent locations yielded 53 void discoveries, many associated with follow-up after an outage before returning to power that are not an operability concern. Voids would be expected to continue to be found in the same manner with the 92-day SR frequency. Some of the remaining voids were discovered by monitoring such indications as accumulator level and RCS leakage. Most of the remaining voids that were discovered by periodic monitoring were so small as not to be of an operability concern. Three voids failed to meet acceptance criteria, two of which challenged operability and occurred 5 years ago. The void discovery history established that the licensee has procedures in place that supplement periodic void monitoring surveillances to address potential void generation, such as accumulator level, RCS leakage, and startup monitoring.

In consideration of the above, the NRC staff concludes that a 92-day surveillance frequency for SRs 3.5.2.3 and 3.6.6.9 is acceptable. The intent of the TS SRs is met if the licensee can establish, through an Operability Determination,¹ that there is a reasonable expectation that the system in question will perform its specified safety function. The regulation at 10 CFR 50.36(c)(3) states that one of the purposes of the SRs is to assure that LCOs are met. Therefore, the new SR language is acceptable since this language will allow the licensee to make a conclusion as to whether or not a system is operable. The NRC staff concludes that the proposed SRs meet the regulatory requirements of 10 CFR 50.36 because they provide assurance that the necessary quality of systems and components will be maintained and that the LCOs will be met.

Additionally, for the reasons discussed earlier, the proposed changes to the TSs to adopt TSTF-523, Revision 2, are acceptable to the NRC staff.

¹ NRC Inspection Manual Chapter 0326, "Operability Determinations & Functionality Assessments for Conditions Adverse to Quality or Safety," January 31, 2014 (ADAMS Accession No. ML13274A578).

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20, and involve changes to 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, and there has been no public comment on such finding published in the *Federal Register* on March 31, 2015 (80 FR 17105). 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.

Principal Contributors: W. Lyon, NRR/DSS/SRXB
M. Chernoff, NRR/DSS/STSB

Date: July 28, 2015

July 28, 2015

Mr. Adam C. Heflin
President, Chief Executive Officer,
and Chief Nuclear Officer
Wolf Creek Nuclear Operating Corporation
P.O. Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION - ISSUANCE OF AMENDMENT RE:
ADOPT TSTF-523, REVISION 2, "GENERIC LETTER 2008-01, MANAGING
GAS ACCUMULATION" (TAC NO. MF5280)

Dear Mr. Heflin:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 212 to Renewed Facility Operating License No. NPF-42 for the Wolf Creek Generating Station. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated November 20, 2014, as supplemented by letters dated March 18 and May 4, 2015.

The amendment revises the TS requirements to address NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," as described in Technical Specification Task Force (TSTF) Traveler TSTF-523, Revision 2, "Generic Letter 2008-01, Managing Gas Accumulation."

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

Sincerely,

/RA/

Carl F. Lyon, Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosures:

1. Amendment No. 212 to NPF-42
2. Safety Evaluation

cc w/encls: Distribution via Listserv

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ADAMS Accession No. ML15169A213

*via memo dated

OFFICE	NRR/DORL/LPL4-1/PM	NRR/DORL/LPL4-1/LA	NRR/DSS/STSB/BC	NRR/DSS/SRXB/BC
NAME	FLyon	JBurkhardt	RElliott	CJackson*
DATE	6/29/15	6/23/15	7/14/15	6/9/15
OFFICE	OGC – NLO	NRR/DORL/LPL4-1/BC	NRR/DORL/LPL4-1/PM	
NAME	JLindell (with comments)	MMarkley	FLyon	
DATE	7/24/15	7/28/15	7/28/15	

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