



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

August 16, 2017

Mr. Richard D. Bologna
Site Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Mail Stop A-BV-SEB1
P.O. Box 4, Route 168
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2 – ISSUANCE OF AMENDMENTS TO ADOPT TECHNICAL SPECIFICATIONS TASK FORCE (TSTF) TRAVELER TSTF-547, REVISION 1 (CAC NOS. MF9887 AND MF9888)

Dear Mr. Bologna:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 299 to Renewed Facility Operating License No. DPR-66 for Beaver Valley Power Station (Beaver Valley), Unit No. 1, and Amendment No. 188 to Renewed Facility Operating License No. NPF-73 for Beaver Valley, Unit No. 2. These amendments consist of changes to the Technical Specifications in response to your application dated June 30, 2017.

The amendments modify requirements on control and shutdown rods, and rod and bank position indication for Beaver Valley, Unit No. 2, consistent with Technical Specifications Task Force (TSTF) Traveler 547, Revision 1, "Clarification of Rod Position Requirements." Additional supporting changes to Beaver Valley, Unit Nos. 1 and 2, Technical Specifications are also made.

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink that reads "V. R. Booma".

Booma Venkataraman, Project Manager
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-334 and 50-412

Enclosures:

1. Amendment No. 299 to DPR-66
2. Amendment No. 188 to NPF-73
3. Safety Evaluation

cc w/enclosures: Distribution via Listserv



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

FIRSTENERGY NUCLEAR OPERATING COMPANY

FIRSTENERGY NUCLEAR GENERATION, LLC

DOCKET NO. 50-334

BEAVER VALLEY POWER STATION, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 299
Renewed License No. DPR-66

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by FirstEnergy Nuclear Operating Company, (FENOC)* acting on its own behalf and as agent for FirstEnergy Nuclear Generation, LLC (the licensees), dated June 30, 2017, 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, 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. DPR-66 is hereby amended to read as follows:

*FENOC is authorized to act as agent for FirstEnergy Nuclear Generation, LLC, and has exclusive responsibility and control over the physical construction, operation, and maintenance of the facility.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 299, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



James G. Danna, Chief
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Date of Issuance: August 16, 2017

ATTACHMENT TO LICENSE AMENDMENT NO. 299

BEAVER VALLEY POWER STATION, UNIT NO. 1

RENEWED FACILITY OPERATING LICENSE NO. DPR-66

DOCKET NO. 50-334

Replace the following pages of the Renewed Facility Operating License with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove
Page 3

Insert
Page 3

Replace the following pages of 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.

Remove

Insert

3.1.4-1

3.1.4.1-1

3.1.4-2

3.1.4.1-2

3.1.4-3

3.1.4.1-3

3.1.4.2-1

3.1.4.2-2

3.1.4.2-3

3.1.5-1

3.1.5.1-1

3.1.5-2

3.1.5.1-2

3.1.5.2-1

3.1.5.2-2

3.1.6-1

3.1.6.1-1

3.1.6-2

3.1.6.1-2

3.1.6.2-1

3.1.6.2-2

3.1.7.1-1

3.1.7.1-1

3.1.7.2-1

3.1.7.2-1

3.1.7.2-2

3.1.7.2-2

3.1.7.2-3

3.1.7.2-3

3.1.9-1

3.1.9-1

5.6-2

5.6-2

- (3) FENOC, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
- (4) FENOC, 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;
- (5) FENOC, 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 following Commission regulations in 10 CFR Chapter 1: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; 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

FENOC is authorized to operate the facility at a steady state reactor core power level of 2900 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 299, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Auxiliary River Water System

(Deleted by Amendment No. 8)

3.1 REACTIVITY CONTROL SYSTEMS

3.1.4 Rod Group Alignment Limits

3.1.4.1 Unit 1 Rod Group Alignment Limits

LCO 3.1.4.1 All shutdown and control rods shall be OPERABLE.

AND

Individual indicated rod positions shall be within 12 steps (as determined in accordance with Specification 3.1.7.1, Unit 1 Rod Position Indication) of their group step counter demand position.

- NOTE -

Verification of rod OPERABILITY and that the individual indicated rod positions are within the 12 step limit is not required during rod motion and for the first hour following rod motion.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more rod(s) inoperable.	A.1.1 Verify SDM to be within the limits specified in the COLR.	1 hour
	<u>OR</u>	
	A.1.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	
	A.2 Be in MODE 3.	6 hours
B. One rod not within alignment limits.	B.1 Restore rod to within alignment limits.	1 hour
	<u>OR</u>	
	B.2.1.1 Verify SDM to be within the limits specified in the COLR.	1 hour
	<u>OR</u>	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>B.2.1.2 Initiate boration to restore SDM to within limit.</p> <p><u>AND</u></p> <p>B.2.2 Reduce THERMAL POWER to $\leq 75\%$ RTP.</p> <p><u>AND</u></p> <p>B.2.3 Verify SDM is within the limits specified in the COLR.</p> <p><u>AND</u></p> <p>B.2.4 Perform SR 3.2.1.1 and SR 3.2.1.2.</p> <p><u>AND</u></p> <p>B.2.5 Perform SR 3.2.2.1.</p> <p><u>AND</u></p> <p>B.2.6 Re-evaluate safety analyses and confirm results remain valid for duration of operation under these conditions.</p>	<p>1 hour</p> <p>2 hours</p> <p>Once per 12 hours</p> <p>72 hours</p> <p>72 hours</p> <p>5 days</p>
<p>C. Required Action and associated Completion Time of Condition B not met.</p>	<p>C.1 Be in MODE 3.</p>	<p>6 hours</p>
<p>D. More than one rod not within alignment limit.</p>	<p>D.1.1 Verify SDM is within the limits specified in the COLR.</p> <p><u>OR</u></p>	<p>1 hour</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	D.1.2 Initiate boration to restore required SDM to within limit.	1 hour
	<u>AND</u>	
	D.2 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.4.1.1 ----- <p style="text-align: center;">- NOTE -</p> This Surveillance is not required to be performed during rod motion and for the first hour following rod motion. ----- Verify individual rod positions within alignment limit.	In accordance with the Surveillance Frequency Control Program
SR 3.1.4.1.2 Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core ≥ 10 steps in either direction.	In accordance with the Surveillance Frequency Control Program
SR 3.1.4.1.3 Verify rod drop time of each rod, from the fully withdrawn position, is ≤ 2.7 seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with: a. $T_{avg} \geq 500^{\circ}\text{F}$ and b. All reactor coolant pumps operating.	Prior to criticality after each removal of the reactor head

3.1 REACTIVITY CONTROL SYSTEMS

3.1.4 Rod Group Alignment Limits

3.1.4.2 Unit 2 Rod Group Alignment Limits

LCO 3.1.4.2 All shutdown and control rods shall be OPERABLE.

AND

Individual indicated rod positions shall be within 12 steps (as determined in accordance with Specification 3.1.7.2, Unit 2 Rod Position Indication) of their group step counter demand position.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more rod(s) inoperable.	A.1.1 Verify SDM to be within the limits specified in the COLR.	1 hour
	<u>OR</u>	
	A.1.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	
	A.2 Be in MODE 3.	6 hours
B. One rod not within alignment limits.	B.1.1 Verify SDM to be within the limits specified in the COLR.	1 hour
	<u>OR</u>	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.1.2 Initiate boration to restore SDM to within limit. <u>AND</u> B.2 Reduce THERMAL POWER to $\leq 75\%$ RTP. <u>AND</u> B.3 Verify SDM is within the limits specified in the COLR. <u>AND</u> B.4 Perform SR 3.2.1.1, SR 3.2.1.2, and SR 3.2.2.1. <u>AND</u> B.5 Re-evaluate safety analyses and confirm results remain valid for duration of operation under these conditions.	1 hour 2 hours Once per 12 hours 72 hours 5 days
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 3.	6 hours
D. More than one rod not within alignment limit.	D.1.1 Verify SDM is within the limits specified in the COLR. <u>OR</u>	1 hour

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	D.1.2 Initiate boration to restore required SDM to within limit.	1 hour
	<u>AND</u>	
	D.2 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.4.2.1 ----- <p style="text-align: center;">- NOTE -</p> Not required to be performed for rods associated with inoperable rod position indicator or demand position indicator. ----- Verify position of individual rods within alignment limit.	In accordance with the Surveillance Frequency Control Program
SR 3.1.4.2.2 Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core ≥ 10 steps in either direction.	In accordance with the Surveillance Frequency Control Program
SR 3.1.4.2.3 Verify rod drop time of each rod, from the fully withdrawn position, is ≤ 2.7 seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with: a. $T_{avg} \geq 500^{\circ}\text{F}$ and b. All reactor coolant pumps operating.	Prior to criticality after each removal of the reactor head

3.1 REACTIVITY CONTROL SYSTEMS

3.1.5 Shutdown Bank Insertion Limits

3.1.5.1 Unit 1 Shutdown Bank Insertion Limits

LCO 3.1.5.1 Each shutdown bank shall be within insertion limits specified in the COLR.

APPLICABILITY: MODES 1 and 2.

- NOTE -

This LCO is not applicable while performing SR 3.1.4.1.2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more shutdown banks not within limits.	A.1.1 Verify SDM is within the limits specified in the COLR.	1 hour
	<u>OR</u>	
	A.1.2 Initiate boration to restore SDM to within limit.	1 hour
B. Required Action and associated Completion Time not met.	<u>AND</u>	
	A.2 Restore shutdown banks to within limits.	2 hours
	B.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1.1	Verify each shutdown bank is within the insertion limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program

3.1 REACTIVITY CONTROL SYSTEMS

3.1.5 Shutdown Bank Insertion Limits

3.1.5.2 Unit 2 Shutdown Bank Insertion Limits

LCO 3.1.5.2 Each shutdown bank shall be within insertion limits specified in the COLR.

- NOTE -

Not applicable to shutdown banks inserted while performing SR 3.1.4.2.2.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One shutdown bank inserted \leq 12 steps beyond the insertion limits specified in the COLR.	A.1 Verify all control banks are within the insertion limits specified in the COLR.	1 hour
	<u>AND</u>	
	A.2.1 Verify SDM is within the limits specified in the COLR.	1 hour
	<u>OR</u>	
	A.2.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	
	A.3 Restore the shutdown bank to within the insertion limits specified in the COLR.	24 hours
B. One or more shutdown banks not within limits for reasons other than Condition A.	B.1.1 Verify SDM is within the limits specified in the COLR.	1 hour
	<u>OR</u>	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.1.2 Initiate boration to restore SDM to within limit. <u>AND</u> B.2 Restore shutdown banks to within limits.	1 hour 2 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.5.2.1 Verify each shutdown bank is within the insertion limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 Control Bank Insertion Limits

3.1.6.1 Unit 1 Control Bank Insertion Limits

LCO 3.1.6.1 Control banks shall be within the insertion, sequence, and overlap limits specified in the COLR.

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

- NOTE -
 This LCO is not applicable while performing SR 3.1.4.1.2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Control bank insertion limits not met.	A.1.1 Verify SDM is within the limits specified in the COLR.	1 hour
	<u>OR</u>	
	A.1.2 Initiate boration to restore SDM to within limit.	1 hour
B. Control bank sequence or overlap limits not met.	<u>AND</u>	
	A.2 Restore control bank(s) to within limits.	2 hours
B. Control bank sequence or overlap limits not met.	B.1.1 Verify SDM is within the limits specified in the COLR.	1 hour
	<u>OR</u>	
	B.1.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.2 Restore control bank sequence and overlap to within limits.	2 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 2 with $k_{eff} < 1.0$.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1.1	Verify estimated critical control bank position is within the limits specified in the COLR.	Within 4 hours prior to achieving criticality
SR 3.1.6.1.2	Verify each control bank insertion is within the insertion limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.1.6.1.3	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

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 Control Bank Insertion Limits

3.1.6.2 Unit 2 Control Bank Insertion Limits

LCO 3.1.6.2 Control banks shall be within the insertion, sequence, and overlap limits specified in the COLR.

- NOTE -
 Not applicable to control banks inserted while performing SR 3.1.4.2.2.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Control bank A, B, or C inserted ≤ 12 steps beyond the insertion, sequence, or overlap limits specified in the COLR.	A.1 Verify all shutdown banks are within the insertion limits specified in the COLR.	1 hour
	<u>AND</u>	
	A.2.1 Verify SDM is within the limits specified in the COLR.	1 hour
	<u>OR</u>	
	A.2.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	
	A.3 Restore the control bank to within the insertion, sequence, and overlap limits specified in the COLR.	24 hours
B. Control bank insertion limits not met for reasons other than Condition A.	B.1.1 Verify SDM is within the limits specified in the COLR.	1 hour
	<u>OR</u>	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.1.2 Initiate boration to restore SDM to within limit. <u>AND</u> B.2 Restore control bank(s) to within limits.	1 hour 2 hours
C. Control bank sequence or overlap limits not met for reasons other than Condition A.	C.1.1 Verify SDM is within the limits specified in the COLR. <u>OR</u> C.1.2 Initiate boration to restore SDM to within limit. <u>AND</u> C.2 Restore control bank sequence and overlap to within limits.	1 hour 1 hour 2 hours
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 2 with $k_{eff} < 1.0$.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.6.2.1 Verify estimated critical control bank position is within the limits specified in the COLR.	Within 4 hours prior to achieving criticality
SR 3.1.6.2.2 Verify each control bank insertion is within the insertion limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.1.6.2.3 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

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Rod Position Indication

3.1.7.1 Unit 1 Rod Position Indication

LCO 3.1.7.1 The Rod Position Indication (RPI) System and the Demand Position Indication System shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

- NOTE -

Separate Condition entry is allowed for each inoperable rod position indicator and each demand position indicator.

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. ----- - NOTE - Not required for misalignment indications during rod motion and for up to 1 hour following rod motion. ----- RPI System indicates one or more potentially misaligned rods.</p>	<p>A.1 Verify the affected rod position by measuring the RPI channel primary voltage.</p>	15 minutes
	<p><u>AND</u></p> <p>A.2.1 Enter applicable Conditions and Required Actions of LCO 3.1.4.1, "Unit 1 Rod Group Alignment Limits," for any rod determined to be misaligned by RPI channel primary voltage measurement.</p>	15 minutes
	<p><u>OR</u></p> <p>A.2.2 Declare the affected RPI inoperable and enter the applicable Conditions and Required Actions of this Specification.</p>	15 minutes

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Rod Position Indication

3.1.7.2 Unit 2 Rod Position Indication

LCO 3.1.7.2 The Digital Rod Position Indication (DRPI) System and the Demand Position Indication System shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

- NOTE -

Separate Condition entry is allowed for each inoperable DRPI and each demand position indicator.

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One DRPI per group inoperable in one or more groups.</p>	<p>A.1 Verify the position of the rod with inoperable DRPI indirectly by using movable incore detectors.</p> <p><u>OR</u></p> <p>A.2.1 Verify the position of the rod with inoperable DRPI indirectly by using the moveable incore detectors.</p> <p><u>AND</u></p>	<p>Once per 8 hours</p> <p>8 hours</p> <p><u>AND</u></p> <p>Once per 31 EFPD thereafter</p> <p><u>AND</u></p> <p>8 hours after discovery of each unintended rod movement</p> <p><u>AND</u></p> <p>8 hours after each movement of rod with inoperable DRPI > 12 steps</p> <p><u>AND</u></p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>A.2.2 Restore inoperable DRPI to OPERABLE status.</p> <p><u>OR</u></p> <p>A.3 Reduce THERMAL POWER to \leq 50% RTP.</p>	<p>Prior to THERMAL POWER exceeding 50% RTP</p> <p><u>AND</u></p> <p>8 hours after reaching RTP</p> <p>Prior to entering MODE 2 from MODE 3</p> <p>8 hours</p>
<p>B. More than one DRPI per group inoperable in one or more groups.</p>	<p>B.1 Place the control rods under manual control.</p> <p><u>AND</u></p> <p>B.2 Restore inoperable DRPIs to OPERABLE status such that a maximum of one DRPI per group is inoperable.</p>	<p>Immediately</p> <p>24 hours</p>
<p>C. One or more DRPI inoperable in one or more groups and associated rod has been moved > 24 steps in one direction since the last determination of the rod's position.</p>	<p>C.1 Verify the position of the rods with inoperable DRPIs indirectly by using movable incore detectors.</p> <p><u>OR</u></p> <p>C.2 Reduce THERMAL POWER to \leq 50% RTP.</p>	<p>8 hours</p> <p>8 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more demand position indicators per bank inoperable in one or more banks.	D.1.1 Verify by administrative means all DRPIs for the affected banks are OPERABLE.	Once per 8 hours
	<u>AND</u>	
	D.1.2 Verify the most withdrawn rod and the least withdrawn rod of the affected banks are ≤ 12 steps apart.	Once per 8 hours
	<u>OR</u>	
	D.2 Reduce THERMAL POWER to $\leq 50\%$ RTP.	8 hours
E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.7.2.1 ----- <p style="text-align: center;">- NOTE -</p> Not required to be met for DRPIs associated with rods that do not meet LCO 3.1.4.2. ----- Verify each DRPI agrees within 12 steps of the group demand position for the full indicated range of rod travel.	Once prior to criticality after each removal of the reactor head

3.1 REACTIVITY CONTROL SYSTEMS

3.1.9 PHYSICS TESTS Exceptions - MODE 2

LCO 3.1.9 During the performance of PHYSICS TESTS, the requirements of:

LCO 3.1.3, "Moderator Temperature Coefficient,"
LCO 3.1.4.1, "Unit 1 Rod Group Alignment Limits,"
LCO 3.1.4.2, "Unit 2 Rod Group Alignment Limits,"
LCO 3.1.5.1, "Unit 1 Shutdown Bank Insertion Limits,"
LCO 3.1.5.2, "Unit 2 Shutdown Bank Insertion Limits,"
LCO 3.1.6.1, "Unit 1 Control Bank Insertion Limits,"
LCO 3.1.6.2, "Unit 2 Control Bank Insertion Limits," and
LCO 3.4.2, "RCS Minimum Temperature for Criticality"

may be suspended, and

1. The number of required channels for LCO 3.3.1, "RTS Instrumentation," Functions 2, 3, and 17.e, may be reduced to 3 required channels provided:
 - a. RCS lowest loop average temperature is $\geq 531^{\circ}\text{F}$,
 - b. SDM is within the limits specified in the COLR, and
 - c. THERMAL POWER is $\leq 5\%$ RTP, and
2. For Unit 1 only, primary detector voltage measurements may be used to determine the position of rods in shutdown banks A and B and control banks A and B for the purpose of satisfying Specification 3.1.7.1.

APPLICABILITY: During PHYSICS TESTS initiated in MODE 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SDM not within limit.	A.1 Initiate boration to restore SDM to within limit.	15 minutes
	<u>AND</u> A.2 Suspend PHYSICS TESTS exceptions.	1 hour
B. THERMAL POWER not within limit.	B.1 Open reactor trip breakers.	Immediately

5.6 Reporting Requirements

5.6.3 CORE OPERATING LIMITS REPORT (COLR) (continued)

LCO 3.1.5.1, "Unit 1 Shutdown Bank Insertion Limits"

LCO 3.1.5.2, "Unit 2 Shutdown Bank Insertion Limits"

LCO 3.1.6.1, "Unit 1 Control Bank Insertion Limits"

LCO 3.1.6.2, "Unit 2 Control Bank Insertion Limits"

LCO 3.2.1, "Heat Flux Hot Channel Factor ($F_Q(Z)$)"

LCO 3.2.2, "Nuclear Enthalpy Rise Hot Channel Factor ($F_{\Delta H}^N$)"

LCO 3.2.3, "Axial Flux Difference (AFD)"

LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation" - Overtemperature and Overpower ΔT Allowable Value parameter values

LCO 3.4.1, "RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits"

LCO 3.9.1, "Boron Concentration"

- b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:

WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology,"

WCAP-8745-P-A, "Design Bases for the Thermal Overtemperature ΔT and Thermal Overpower ΔT Trip Functions,"

WCAP-12945-P-A, Volumes 1 through 5, "Code Qualification Document for Best Estimate LOCA Analysis,"

(For Unit 1 only) WCAP-16009-P-A, "Realistic Large Break LOCA Evaluation Methodology Using Automated Statistical Treatment of Uncertainty Method (ASTRUM),"

WCAP-10216-P-A, "Relaxation of Constant Axial Offset Control/ F_Q Surveillance Technical Specification,"

WCAP-14565-P-A, "VIPRE-01 Modeling and Qualification for Pressurized Water Reactor Non-LOCA Thermal-Hydraulic Safety Analysis,"

WCAP-12610-P-A, "VANTAGE+ Fuel Assembly Reference Core Report,"

WCAP-15025-P-A, "Modified WRB-2 Correlation, WRB-2M, for Predicating Critical Heat Flux in 17x17 Rod Bundles with Modified LPD Mixing Vane Grids,"

WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," March 1997 (Westinghouse Proprietary),



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

FIRSTENERGY NUCLEAR OPERATING COMPANY

FIRSTENERGY NUCLEAR GENERATION, LLC

DOCKET NO. 50-412

BEAVER VALLEY POWER STATION, UNIT NO. 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 188
Renewed License No. NPF-73

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by FirstEnergy Nuclear Operating Company, (FENOC)* acting on its own behalf and as agent for FirstEnergy Nuclear Generation, LLC (the licensees), dated June 30, 2017, 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, 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. DPR-66 is hereby amended to read as follows:

*FENOC is authorized to act as agent for FirstEnergy Nuclear Generation, LLC, and has exclusive responsibility and control over the physical construction, operation, and maintenance of the facility.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 188, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto and hereby incorporated in the license. FENOC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



James G. Danna, Chief
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Date of Issuance: August 16, 2017

ATTACHMENT TO LICENSE AMENDMENT NO. 188

BEAVER VALLEY POWER STATION, UNIT NO. 2

RENEWED FACILITY OPERATING LICENSE NO. NPF-73

DOCKET NO. 50-412

Replace the following page of the Renewed Facility Operating License with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove
Page 4

Insert
Page 4

Beaver Valley Power Station, Unit Nos. 1 and 2, share a common Appendix A, Technical Specifications. As such, the replacement pages listed in the attachment to License Amendment No. 299 for Unit No. 1 are also applicable for Amendment No. 188 for Unit No. 2.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations set forth in 10 CFR Chapter 1 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

FENOC is authorized to operate the facility at a steady state reactor core power level of 2900 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 188, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto are hereby incorporated in the license. FENOC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 299 AND 188 TO

RENEWED FACILITY OPERATING LICENSES NOS. DPR-66 AND NPF-73

FIRSTENERGY NUCLEAR OPERATING COMPANY

FIRST ENERGY NUCLEAR GENERATION, LLC

BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-334 AND 50-412

1.0 INTRODUCTION

By application dated June 30, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17181A464), FirstEnergy Nuclear Operating Company, et al. (the licensees), requested changes to the Technical Specifications (TSs) for Beaver Valley Power Station (Beaver Valley), Unit Nos. 1 and 2. The application requests adoption of Technical Specifications Task Force (TSTF) Traveler TSTF-547, "Clarification of Rod Position Requirements," for Unit No. 2 and editorial changes for Unit Nos. 1 and 2 TSs.

By letter dated December 31, 2015 (ADAMS Accession No. ML15365A610), the Technical Specifications Task Force submitted Revision 1 to Improved Standard Technical Specifications Change Traveler TSTF-547. TSTF-547 proposes changes to Volumes 1 and 2 of NUREG-1431, Revision 4, "Standard Technical Specifications, Westinghouse Plants," published April 2012 (ADAMS Accession Nos. ML12100A222 and ML12100A228, respectively). On March 4, 2016 (ADAMS Package Accession No. ML16012A126), the U.S. Nuclear Regulatory Commission (NRC or the Commission) issued its final safety evaluation of TSTF-547, Revision 1.

The proposed changes would revise the Unit No. 2 TSs to provide time to correct rod movement failures that do not affect operability and provide an alternative to frequent verification of rod position using the movable incore detectors. The proposed changes would also align requirements of TSs 3.1.4, "Rod Group Alignment Limits," and 3.1.7, "Rod Position Indication"; eliminate an unnecessary required action (RA) from TS 3.1.7; and make some editorial improvements to TSs 3.1.4, 3.1.5, "Shutdown Bank Insertion Limits," 3.1.6, "Control Bank Insertion Limits," and 3.1.7.

2.0 REGULATORY EVALUATION

2.1 Description of Rod Cluster Control Assemblies

The rod cluster control assemblies (RCCA), or rods, are moved by their control rod drive mechanisms. Each control rod drive mechanism moves its RCCA one step (approximately 5/8 inch) at a time, but at varying rates (steps per minute) depending on the signal output from the

Rod Control System. The RCCAs are divided among control banks and shutdown banks. Each bank may be further subdivided into two groups to provide for precise reactivity control. A group consists of two or more RCCAs that are electrically paralleled to step simultaneously. If a bank of RCCAs consists of two groups, the groups are moved in a staggered fashion, but always within one step of each other. All units have four control banks and at least two shutdown banks.

The shutdown banks are maintained either in the fully inserted or fully withdrawn position. The control banks are moved in an overlap pattern using the following withdrawal sequence:

When control bank A reaches a predetermined height in the core, control bank B begins to move out with control bank A. Control bank A stops at the position of maximum withdrawal, and control bank B continues to move out. When control bank B reaches a predetermined height, control bank C begins to move out with control bank B. This sequence continues until control banks A, B, and C are at the fully withdrawn position, and control bank D is approximately halfway withdrawn. The insertion sequence is the opposite of the withdrawal sequence. The control rods are arranged in a radially symmetric pattern, so that control bank motion does not introduce radial asymmetries in the core power distributions.

The control banks are used for precise reactivity control of the reactor. The positions of the control banks are normally automatically controlled by the Rod Control System, but they can also be manually controlled. They are capable of adding negative reactivity very quickly (compared to borating). The control banks must be maintained above designed insertion limits and are typically near the fully withdrawn position during normal full power operations.

The axial position of shutdown rods and control rods is indicated by two separate and independent systems, which are the Bank Demand Position Indication System (BDPI) (commonly called group step counters) and the Rod Position Indication (RPI) System. The BDPI System counts the pulses from the Rod Control System that moves the rods. There is one step counter for each group of rods. Individual rods in a group all receive the same signal to move and should, therefore, all be at the same position indicated by the group step counter for that group. The BDPI System is considered relatively precise (± 1 step or $\pm 5/8$ inch). If a rod does not move one step for each demand pulse, the step counter will still count the pulse but incorrectly reflect the position of the rod.

However, the RPI System provides a more accurate indication of actual rod position, but at a lower precision than the step counters. This system is based on inductive analog signals from a series of coils spaced along a hollow tube. To increase the reliability of the system, the inductive coils are connected alternately to data system A or B. Thus, if one data system fails, the RPI will indicate rod position with half accuracy. The RPI System is capable of monitoring rod position within at least ± 12 steps with either full accuracy or half accuracy. Depending on the plant design, the RPI system may be analog or digital. The digital system is called the Digital Rod Position Indication (DRPI) System. Beaver Valley, Unit No. 2, has a DRPI System.

The shutdown margin (SDM) is defined in NUREG-1431 as the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming:

- a. All RCCAs are fully inserted except for the single RCCA of highest reactivity worth, which is assumed to be fully withdrawn. However, with all RCCAs verified fully inserted by two independent means, it is not necessary to account for a stuck RCCA in the SDM

calculation. With any RCCA not capable of being fully inserted, the reactivity worth of the RCCA must be accounted for in the determination of SDM, and

- b. In power operation and startup, the fuel and moderator temperatures are changed to the nominal zero power design level.

The Core Operating Limits Report (COLR) is defined in NUREG-1431 as the unit-specific document that provides cycle-specific parameter limits for the current reload cycle. These cycle-specific parameter limits must be determined for each reload cycle in accordance with TS 5.6.3. Plant operation within these limits is addressed in individual specifications.

2.2 Description of Changes

This safety evaluation addresses changes to the TS governing rod group alignment limits (TS 3.1.4), shutdown bank insertion limits (TS 3.1.5), control bank insertion limits (TS 3.1.6), and rod position indication instrumentation (TS 3.1.7). The specific changes are described in the following subsections. The discussion is applicable to Beaver Valley, Unit No. 2, unless otherwise stated.

Beaver Valley, Unit Nos. 1 and 2, share a common set of TSs. In the application, the licensee proposed to renumber the existing limiting conditions for operation (LCOs) 3.1.4, 3.1.5, and 3.1.6 to distinguish between Beaver Valley, Unit Nos. 1 and 2. The LCOs would be renumbered 3.1.4.1, 3.1.5.1, and 3.1.6.1 to signify their applicability to Beaver Valley, Unit No. 1; and renumbered as 3.1.4.2, 3.1.5.2, and 3.1.6.2 to signify applicability to Beaver Valley, Unit No. 2. The associated Surveillance Requirements (SRs) are being similarly renumbered. The existing TSs contain a separate TS 3.1.7.1 and TS 3.1.7.2, for Beaver Valley, Unit Nos. 1 and 2, respectively. In the context of this safety evaluation, references to current TS requirements use the numbering scheme in the current TSs, and references to the proposed TS changes use the new numbering scheme.

2.2.1 Provide Time to Correct Rod Movement Failures that Do Not Affect Operability

LCO 3.1.5 requires that each shutdown bank be within insertion limits specified in the COLR. Current Condition A for one or more shutdown banks not within the limits requires:

- A.1.1 Verify SDM is within the limits specified in the COLR within 1 hour.

OR

- A.1.2 Initiate boration to restore SDM to within limit within 1 hour.

AND

- A.2 Restore shutdown banks to within limits within 2 hours.

LCO 3.1.6 requires that each control bank be within insertion, sequence, and overlap limits specified in the COLR. Current Condition A for control bank insertion limits not met requires:

- A.1.1 Verify SDM is within the limits specified in the COLR within 1 hour.

OR

A.1.2 Initiate boration to restore SDM to within limit within 1 hour.

AND

A.2 Restore control bank(s) to within limits within 2 hours.

The proposed change would revise Condition A in new LCO 3.1.5.2 that would require with one shutdown bank inserted ≤ 12 steps beyond the insertion limits specified in the COLR:

A.1 Verify all control banks are within the insertion limits specified in the COLR within 1 hour.

AND

A.2.1 Verify SDM is within the limits specified in the COLR within 1 hour.

OR

A.2.2 Initiate boration to restore SDM to within limit within 1 hour.

AND

A.3 Restore the shutdown bank to within the insertion limits specified in the COLR within 24 hours.

Proposed LCO 3.1.5.2 Condition B would apply when one or more shutdown banks are not within limits for reasons other than Condition A. RA B.1.1 would require verifying SDM is within the limits specified in the COLR within 1 hour or initiating boration to restore SDM to within the limit within 1 hour. RA B.2 would require restoring shutdown banks to within limits within 2 hours. LCO 3.1.5.2 Condition C would apply if the RA and completion time were not met and would require the unit to be in Mode 3 within 6 hours.

The proposed change would add a new Condition A to new LCO 3.1.6.2 that would require if control bank A, B, or C is inserted ≤ 12 steps beyond the insertion, sequence, or overlap limits specified in the COLR:

A.1 Verify all shutdown banks are within the insertion limits specified in the COLR within 1 hour.

AND

A.2.1 Verify SDM is within the limits specified in the COLR within 1 hour.

OR

A.2.2 Initiate boration to restore SDM to within the limit within 1 hour.

AND

A.3 Restore the control bank to within the insertion, sequence, and overlap limits specified in the COLR within 24 hours.

Proposed LCO 3.1.6.2 Condition B would apply when control bank insertion limits are not met for reasons other than Condition A. The RAs would require verifying SDM is within the limits specified in the COLR within 1 hour (RA B.1.1) or initiating boration to restore SDM to within the limit within 1 hour (RA B.1.2). RA B.2 would require restoring control banks to within limits within 2 hours.

Proposed LCO 3.1.6.2 Condition C would apply when control bank sequence or overlap limits are not met for reasons other than Condition A. The RAs of new Condition C are relettered from the current LCO 3.1.6 Condition B RAs.

Proposed LCO 3.1.6.2 Condition D, relettered from the previous LCO Condition C to reflect the insertion of Condition A, is retained from current TSs.

The shutdown banks must be within their insertion limits any time the reactor is critical or approaching criticality. This ensures that a sufficient amount of negative reactivity is available to shut down the reactor and maintain the required SDM following a reactor trip.

The limits on control banks sequence, overlap, and physical insertion, as defined in the COLR, must be maintained because they serve the function of preserving power distribution, ensuring that the SDM is maintained, ejected rod worth is maintained, and adequate negative reactivity insertion is available on trip.

2.2.2 Provide an Alternative to Frequent Verification of Rod Position Using the Movable Incore Detectors

LCO 3.1.7.2, "Unit 2 Rod Position Indication," requires that the DRPI and the Demand Position Indication System be operable during Startup and Power Operation. Condition A applies for one DRPI per group inoperable for one or more groups of rods. The associated RAs are:

A.1 Verify the position of the rods with inoperable position indicators indirectly by using movable incore detectors once per 8 hours.

OR

A.2 Reduce THERMAL POWER to $\leq 50\%$ RTP within 8 hours.

The revised LCO 3.1.7.2 would add two new RAs (RA A.2.1 and RA A.2.2) for Condition A, with other minor edits, as alternatives to the once per 8-hour indirect determination of rod position. The revised RAs would be:

A.1 Verify the position of the rod with inoperable DRPI indirectly by using moveable incore detectors once per 8 hours.

OR

A.2.1 Verify the position of the rod with inoperable DRPI indirectly by using the moveable incore detectors within 8 hours, once per 31 EFPD [effective

full power days] thereafter, within 8 hours after discovery of each unintended rod movement, within 8 hours after each movement of rod with inoperable DRPI > 12 steps, prior to thermal power exceeding 50 % RTP [rated thermal power] and within 8 hours after reaching RTP.

AND

A.2.2 Restore inoperable DRPI to OPERABLE status prior to entering MODE 2 [startup] from MODE 3 [hot standby].

OR

A.3 Reduce THERMAL POWER to \leq 50% RTP within 8 hours.

LCO 3.1.4.2 requires that all individual indicated rod positions are within 12 steps, as determined in accordance with TS 3.1.7.2, of their group step counter demand position. The 12-step agreement limit between the BDPI System and the DRPI System indicates that the BDPI System is adequately calibrated and can be used for indication of the measurement of control rod bank position. When one DRPI channel per group fails, the position of the rod may still be determined indirectly by use of the movable incore detectors.

SR 3.1.4.2.1 requires verification that the individual rods are within the alignment limit in accordance with the Surveillance Frequency Control Program. This SR is proposed to be modified by a Note to indicate that the SR is not applicable for rods with an inoperable rod position indicator or demand position indicator.

Verification that individual rod positions are within alignment limits at the frequency specified in the Surveillance Frequency Control Program provides a history that allows the operator to detect a rod that is beginning to deviate from its expected position. The specified frequency takes into account other rod position information that is continuously available to the operator in the control room so that during actual rod motion, deviations can immediately be detected.

2.2.3 Allow Time for Thermal Equilibrium of Analog RPI

This section of TSTF-547 and corresponding section of the model safety evaluation is not applicable to Beaver Valley, Unit No. 2, as it is not applicable to plants with DRPI Systems. This does not impact the evaluation of the other TS changes described in this safety evaluation.

2.2.4 Clarify SRs in TS 3.1.4 and TS 3.1.7

Current LCO 3.1.4 specifies that all shutdown and control rods shall be operable, and individual indicated rod positions shall be within 12 steps (as determined in accordance with TS 3.1.7) of their group step counter demand position. Proposed LCO 3.1.4.2 specifies that all shutdown and control rods shall be operable, and individual indicated rod positions shall be within 12 steps (as determined in accordance with Unit No. 2 TS 3.1.7.2) of their group step counter demand position.

Current SR 3.1.4.1 requires verifying the position of individual rods are within the alignment limits with a frequency in accordance with the Surveillance Frequency Control Program. The proposed change is the addition of a Note to proposed SR 3.1.4.2.1 stating that the SR is not required to be performed for rods associated with an inoperable rod position indicator or

demand position indicator. This Note is being added because SR 3.1.4.2.1 cannot be performed for rods with an inoperable rod position indicator or demand position indicator.

Current SR 3.1.7.2.1 requires verification that each DRPI agrees within the required steps of the group demand position for the full indicated range of rod travel. The proposed change is the addition of a Note to SR 3.1.7.2.1 stating that the SR would not be required to be met for rods known not to meet LCO 3.1.4.2

2.2.5 Eliminate an Unnecessary RA from TS 3.1.7.2

LCO 3.1.7.2, "Unit 2 Rod Position Indication," requires that the DRPI and the Demand Position Indication System be operable during Mode 2, startup, and Mode 1, power operation. Condition B is applicable when more than one DRPI per group is inoperable. Existing RA B.2 states, "Monitor and record Reactor Coolant System T_{avg} ."

RA B.2 is proposed to be deleted.

The existing RA B.3 is also being deleted as described below in Section 2.2.6, Item 5. Existing RA B.4 is being renumbered as B.2.

2.2.6 Other Proposed Changes

The proposed changes described in this section are editorial and do not change the technical content.

1. Proposed LCO 3.1.4.2 contains some modifications to the RAs associated with Condition B in existing LCO 3.1.4. Condition B is revised to eliminate RA B.1 and to combine RAs B.2.4 and B.2.5. Condition B applies when one rod is not within the alignment limits, and RA B.1 requires restoring the rod to within limits within 1 hour. An alternative set of RAs is provided in the RA section and will continue to be required when Condition B is applicable. RA B.1 is an action that requires restoration of equipment such that the condition does not apply. Restoring equipment to operable status is understood to be an option. Therefore, stating this as an RA is not necessary.

Combining RAs B.2.4 and B.2.5 is editorial and has no technical implications.

2. Existing LCO 3.1.5 and LCO 3.1.6 contain a Note modifying their applicability that states, "This LCO is not applicable while performing SR 3.1.4.2." In proposed LCOs 3.1.5.2 and 3.1.6.2, the LCO 3.1.5 and LCO 3.1.6 applicability Notes are moved to LCO Notes and revised to state, "Not applicable to shutdown banks inserted while performing SR 3.1.4.2.2" for LCO 3.1.5.2 and "Not applicable to control banks inserted while performing SR 3.1.4.2.2" for LCO 3.1.6.2. This change clarifies the note and does not alter its meaning.
3. TS 3.1.7.2 is revised to consistently use the defined abbreviation "DRPI."
4. TS 3.1.7.2 Condition A is revised from "for one or more groups" to the more standard terminology "in one or more groups," and TS 3.1.7 Condition B is revised to include the phrase "in one or more groups" to be more consistent with the wording of Condition A.

5. TS 3.1.7.2 RA B.3 is redundant to RA A.1. RA B.3 is proposed to be deleted. Condition A applies when one DRPI per group is inoperable and Condition B applies when more than one DRPI per group is inoperable. Each entry into Condition B also requires entry into Condition A. Restating the RA is not necessary.
6. TS 3.1.7.2 Condition C is revised to contain similar terminology to Conditions A and B. The existing Condition C states, "One or more rods with inoperable position indicators have been moved in excess of 24 steps in one direction since the last determination of the rod's position." Conditions A and B are worded such that the condition describing the inoperable equipment (e.g., "One DRPI per group inoperable...") is listed first. The proposed change rewords Condition C to state, "One or more DRPI inoperable in one or more groups and associated rod has been moved > 24 steps in one direction since the last determination of the rod's position."
7. LCO 3.1.7.2 Condition D is revised from "One demand position indicator per bank inoperable for one or more banks" to "One or more demand position indicators per bank inoperable in one or more banks." The proposed change makes the terminology consistent with the Note modifying the RAs.

The current TS 3.1.7.2 is modified by a Note which states, "Separate Condition entry is allowed for each inoperable rod position indicator and each demand position indicator." The bases for the Note states that the Note is acceptable because the RAs for each condition provide appropriate compensatory actions for each inoperable indicator.

There is one demand position indicator per group of rods. For banks with two groups of rods, there are two demand indicators per bank. The separate condition entry Note modifying the TS 3.1.7.2 actions states that separate condition entry is allowed for inoperable demand position indicators, which means that Condition D is applicable to more than one inoperable demand position indicator per bank. The proposed change makes the existing Condition D terminology consistent with the Note.

2.2.7 Variations from TSTF-547

The licensee identified several variations from the TS changes contained in TSTF-547:

1. TSs 3.1.4, 3.1.5, and 3.1.6 would be split into separate subsections for each Beaver Valley unit.
2. TSs 3.1.4, 3.1.5, and 3.1.6, which have been split into subsections for each Beaver Valley unit, have renumbered LCOs that are referenced in TSs 3.1.9, "PHYSICS TEST Exceptions – MODE 2," and 5.6.3, "CORE OPERATING LIMITS REPORT (COLR)." The references to LCOs 3.1.4, 3.1.5, and 3.1.6 are updated in TS 3.1.9 LCO. The references to LCOs 3.1.4 and 3.1.5 are updated in TS 5.6.3.a.
3. "Overlap" was inadvertently left out of the TSTF-547, Revision 1, changes in TS 3.1.6. "Overlap" is, therefore, inserted before "limits" in RA A.3. This is consistent with proposed TS 3.1.6 LCO 3.1.6.2, Conditions A and C, RA C.2, and SR 3.1.6.2.3.
4. "Rods" is changed to "rod" in TS 3.1.7.2 RA A.2.1 for consistency with RA A.1.

5. RAs C.1.1 and C.1.2 in current TS 3.1.7.2 state, "C.1.1 Initiate action to verify the position of the rods with inoperable position indicators indirectly by using movable incore detectors. AND C.1.2 Complete rod position verification started in Required Action C.1.1." The completion time is immediately for RA C.1.1 and 8 hours for RA C.1.2. The proposed RA C.1 in TSTF-547 replaces the current RAs with "Verify the position of the rods with inoperable DRPIs indirectly by using movable incore detectors." The proposed completion time is 8 hours and, therefore, is effectively the same as the current TSs.

2.2.8 Additional Beaver Valley, Unit No. 1, Changes

The following editorial changes were made to the Beaver Valley, Unit No. 1, TSs as a result of splitting TSs 3.1.4, 3.1.5, and 3.1.6.

1. The note for renumbered Beaver Valley, Unit No. 1, LCO 3.1.4.1 would be revised to remove "For Unit 1 only," as this specification would apply to Beaver Valley, Unit No. 1, only.
2. The note for renumbered Beaver Valley, Unit No. 1, SR 3.1.4.1.1 would be revised to remove "For Unit 1 only," as TS 3.1.4.1 only applies to Beaver Valley, Unit No. 1.
3. The RA A.2.1 for TS 3.1.7.1 was changed from "Enter applicable Conditions and Required Actions of LCO 3.1.4, 'Rod Group Alignment Limits,' for any rod determined to be misaligned by RPI channel primary voltage measurement," to "Enter applicable Conditions and Required Actions of LCO 3.1.4.1, 'Unit 1 Rod Group Alignment Limits,' for any rod determined to be misaligned by RPI channel primary voltage measurement." This was done to ensure the reference was accurate as a result of splitting of TS 3.1.4.
4. The Note in the applicability section of TS 3.1.5.1 was changed from "This LCO is not applicable while performing SR 3.1.4.2," to "This LCO is not applicable while performing SR 3.1.4.1.2." This was done to ensure the reference was accurate as a result of splitting of TS 3.1.4.
5. The LCO for TS 3.1.4.1 was changed from "...Individual indicated rod positions shall be within 12 steps (as determined in accordance with Specification 3.1.7, Rod Position Indication) of their group step counter demand position," to "...Individual indicated rod positions shall be within 12 steps (as determined in accordance with Specification 3.1.7.1, Unit 1 Rod Position Indication) of their group step counter demand position." This was done to ensure the reference was accurate.

2.3 Regulatory Review

The categories of items required to be in the TSs are provided in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(c). As required by 10 CFR 50.36(c)(2)(i), the TSs will include LCOs, which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. Per 10 CFR 50.36(c)(2)(i), when an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met. The regulation at 10 CFR 50.36(c)(3) requires TSs to include items in the category of SRs, which 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. Also, 10 CFR 50.36(a)(1) states that a summary statement of the bases or reasons for such

specifications, other than those covering administrative controls, shall also be included in the application, but shall not become part of the TSs.

The NRC staff's guidance for review of TSs is in Chapter 16, "Technical Specifications," of NUREG-0800, Revision 3, "Standard Review Plan," March 2010 (ADAMS Accession No. ML100351425). As described therein, as part of the regulatory standardization effort, the NRC staff has prepared Standard Technical Specifications (STS) for each of the light-water reactor nuclear designs. NUREG-1431 contains the STS for Westinghouse-designed plants.

3.0 TECHNICAL EVALUATION

In its review of TSTF-547, the NRC staff reviewed the proposed changes to NUREG-1431 and the technical justification for the changes provided in TSTF-547. The NRC staff reviewed the technical justification for the proposed changes to ensure the reasoning was logical, complete, and clearly written, as described in Chapter 16 of NUREG-0800. The NRC staff reviewed the proposed changes for continued compliance with the requirements of 10 CFR 50.36 and for consistency with conventional terminology and the format and usage rules embodied in the STS. The NRC staff considered whether there should be any limitations or conditions placed on adoption of the TSTF-547 by future applicants.

3.1 Provide Time to Correct Rod Movement Failures that Do Not Affect Operability Review

The proposed new Condition A of TSs 3.1.5.2 and 3.1.6.2 for shutdown and control bank insertion limits would allow 24 hours to restore a single bank to be within its insertion limit when inserted below the insertion limit. With one shutdown or control bank inserted a maximum of 12 steps below the rod insertion limit, the RAs associated with new Condition A also require verification that all other control and shutdown banks are within the insertion limits and verification that the reactor can be shut down using control rods or boration. The completion time for these RAs is 1 hour.

The new conditions define limits of both duration and insertion if a bank is immovable due to failures external to the control rod drive mechanism. A maximum of one control or shutdown bank may be inserted beyond the limits for a maximum of 24 hours, provided all other banks are within the insertion limits and that the reactor could be shut down using control rods or boration. The new Condition A imposes a limit on the insertion of 12 steps less than the insertion limit. The value of 12 steps corresponds to the minimum number of steps that the rods must be moved to ensure correct performance of SR 3.1.4.2.2.

The NRC staff reviewed the justification for the proposed addition of Condition A to TSs 3.1.5 and 3.1.6 provided in the Technical Evaluation Section of TSTF-547 to ensure the reasoning is logical, complete, and clearly written. This corresponds to TSs 3.1.5.2 and 3.1.6.2 for Beaver Valley, Unit No. 2. The justification in TSTF-547 states:

1. All control and shutdown rod assemblies are required to be Operable. If a rod is untrippable (i.e., inoperable), then a plant shutdown is required in accordance with LCO 3.1.4, Condition A. (LCO 3.1.4.2 for Beaver Valley, Unit No. 2)
2. Only one control bank and shutdown bank may be inserted beyond insertion limits by no more than 12 steps. If one or more control banks or

shutdown banks exceed the insertion limit, a brief time period is permitted to correct the condition and then a plant shutdown is required.

3. If one rod is not within the alignment limits, adequate SDM is verified and a power reduction is required by LCO 3.1.4, Condition B. If more than one rod is not within the alignment limit, adequate SDM is verified and a plant shutdown is required. (LCO 3.1.4.2 for Beaver Valley, Unit No. 2)

The insertion limits are established to ensure a sufficient amount of negative reactivity can be rapidly inserted to shut down the reactor. The NRC staff finds that allowing continued full-power operations for 24 hours with a rod movement failure is acceptable for the following reasons:

1. The SDM continues to be met;
2. All control and shutdown rods are trippable (i.e., capable of being rapidly inserted into the core);
3. Only one bank may exceed insertion limits by no more than a specified number of steps;
4. All immovable rod assemblies are aligned; and
5. The rods must be restored to within the insertion limits within 24 hours.

The change to TS 3.1.5.2 and TS 3.1.6.2 to provide time to correct rod movement failures that do not affect operability will allow sufficient time for diagnosis and repairs while maintaining the safety function of the control rods, since the affected rods are still trippable. The thermal margins may be affected by power distribution changes due to control rod bank insertion, both during the insertion and during the resulting local xenon transient. However, insertions at or near the typical value of 16 steps from fully withdrawn, as provided in the proposed changes to TSs 3.1.5.2 and 3.1.6.2, would result in a very small negative reactivity impact at the top of active fuel. The resulting effect on the axial power distribution is not expected to be significant. In addition, alignment of all rods with the rod bank position (as per LCO 3.1.4.2) must be maintained, and it will be verified that the reactor can still be shutdown. Therefore, the NRC staff has determined that the proposed 24-hour completion time for Condition A in LCOs 3.1.5.2 and 3.1.6.2 specifying shutdown bank and control bank insertion limits is acceptable.

The NRC staff concludes that TS 3.1.5.2 and TS 3.1.6.2, as modified by the addition of Condition A, continue to specify the minimum performance level of equipment needed for safe operation of the facility as an LCO and continue to specify the appropriate remedial measures if the LCO is not met. SRs are not being changed by the addition of Condition A. The NRC staff finds that the requirements of 10 CFR 50.36(c)(2) continue to be met because the minimum performance level of equipment needed for safe operation of the facility is contained in the LCO, and the appropriate remedial measures are specified if the LCO is not met.

3.2 Provide an Alternative to Frequent Verification of Rod Position Using the Movable Incore Detectors Review

LCO 3.1.7.2 requires that the DRPI and the Demand Position Indication System be operable during power operation and startup. When one or more DRPI are inoperable, current TS 3.1.7.2 requires verification of rod position once per 8 hours, using the movable incore detector system

or a reduction in thermal power to less than or equal to 50 percent rated thermal power (RTP) within 8 hours. The proposed change provides an alternative set of RAs.

New RA A.2.1 requires use of the movable detector system to monitor the position of the rod within 8 hours of the inoperability of DRPI 8 hours after discovery of each unintended rod movement, 8 hours after each greater than 12-step movement of a rod with inoperable DRPI prior to exceeding 50 percent RTP, 8 hours after reaching RTP, and once per 31 effective full power days thereafter. New RA A.2.2 would require the inoperable DRPI to be restored to operable status prior to entering startup from hot standby.

The implementation of new RAs A.2.1 and A.2.2 would allow use of an alternative monitoring scheme until the next shutdown, after which the DRPI must be restored to an operable status. The NRC staff finds that the new RAs A.2.1 and A.2.2 and completion times are more appropriate because they require verification of rod position following circumstances in which rod motion could occur. This is more appropriate than current TS 3.1.7.2 RA A.1, which requires verification of rod position using the movable incore detection system once per 8 hours regardless of whether the rods have moved or not. Additionally, the new RAs A.2.1 and A.2.2 contain a requirement to restore the DRPI to operable status prior to restart.

If the rod position indication is failed for an individual rod, its position is determined indirectly by use of the movable incore detectors. The NRC staff has determined that this change, which verifies rod position using the movable incore detectors based on the occurrence of events requiring rod motion, rather than determining position on a specified frequency, is acceptable because events requiring rod motion of the shutdown banks and control banks A, B, and C are relatively infrequent during steady state operation. Events involving significant movement of rods in control bank D are also relatively infrequent. The indirect determination of rod position is required after significant changes in power level or following substantial rod motion.

The addition of the Note to SR 3.1.4.2.1 stating that the SR is not required to be performed for rods associated with an inoperable DRPI or demand position indicator is appropriate because the RAs of TS 3.1.7.2 for an inoperable DRPI provide the appropriate actions for indirectly determining the position of the affected rods.

The NRC staff concludes that the addition of an alternative monitoring scheme to indirectly determine the position of rods associated with an inoperable DRPI is acceptable. TS 3.1.7.2, as modified, continues to specify the minimum performance level of equipment needed for safe operation of the facility as an LCO and continues to specify the appropriate remedial measures if the LCO is not met. The revised SR 3.1.4.2.1, which has been clarified to specify when it is required to be performed, continues to be an appropriate test to ensure that the necessary quality of systems is maintained. The NRC staff finds that the requirements of 10 CFR 50.36(c)(2) continue to be met because the minimum performance level of equipment needed for safe operation of the facility is contained in the LCO, and the appropriate remedial measures are specified if the LCO is not met. The NRC staff finds that the requirements of 10 CFR 50.36(c)(3) continue to be met because the revised SR provides the appropriate testing to ensure the necessary quality of components is maintained and that the LCO will be met.

3.3 Clarify SRs in TS 3.1.4.2 and TS 3.1.7.2 Review

3.3.1 Clarification of SR 3.1.4.2.1

A Note is being added to SR 3.1.4.2.1 stating that this SR is not required to be performed for rods associated with an inoperable demand position indicator or DRPI. The alignment limit is based on the demand position indicator. If the bank demand position indicator is inoperable, the SR cannot be performed.

LCO 3.1.4.2 requires that all shutdown and control rods shall be operable, and individual indicated rod positions shall be within 12 steps of their group step counter demand position. SR 3.1.4.2.1 requires verification of the individual rod positions within the alignment limit periodically. SR 3.1.4.2.1 cannot be performed for rods with an inoperable bank demand position indicator. Failure to meet an SR is considered a failure to meet an LCO requirement. Therefore, without the clarifying note, if SR 3.1.4.2.1 cannot be performed, entry into LCO 3.1.4.2 Condition D is required. LCO 3.1.4.2 Condition D applies when more than one rod is not within the alignment limit. The RA associated with Condition D requires, in part, that the reactor be in Mode 3 (hot standby) within 6 hours.

LCO 3.1.7.2 requires the DRPI and bank demand position indication to be operable. LCO 3.1.7.2 Condition D applies if one demand position indicator per bank is inoperable for one or more banks. The Condition D RAs require verification that all DRPIs for the affected banks are operable and require verification that the most withdrawn rod and least withdrawn rod of the affected banks are less than or equal to 12 steps apart once per 8 hours. Alternatively, thermal power must be reduced to less than or equal to 50 percent RTP.

Following modification of SR 3.1.4.2.1, Condition D of LCO 3.1.7.2 would be the applicable condition to be entered in the event of inoperable demand position indicators. The RAs associated with Condition D of LCO 3.1.7.2 provide the appropriate actions in this situation by requiring that the DRPIs are operable and that the individual rods in the bank are not misaligned by more than 12 steps.

3.3.2 Clarification of SR 3.1.7.2.1

A Note is being added to SR 3.1.7.2.1 stating that this SR is not required to be performed for rods that are known not to meet LCO 3.1.4.2.

LCO 3.1.4.2 requires that all shutdown and control rods shall be operable, and individual indicated rod positions shall be within 12 steps of their group step counter demand position.

LCO 3.1.7.2 requires the DRPI and bank demand position indication to be operable.

SR 3.1.7.2.1 requires verification that each DRPI agree within 12 steps of the group demand position for the full indicated range of rod travel. This SR is performed once prior to criticality after each removal of the reactor head. Failure to meet an SR is considered a failure to meet the LCO per SR 3.0.1. The requirements of SRs must be satisfied in-between performances of the surveillance test itself. If a control or shutdown rod is not within 12 steps of its bank demand position indication, then the requirements of both LCO 3.1.4.2 and LCO 3.1.7.2 are not met.

If a rod is known not to be within 12 steps of the group demand position, LCO 3.1.4.2 provides the appropriate RAs. With one rod not within the alignment limit, LCO 3.1.4.2 Condition B

requires verification of shutdown margin or boration until SDM is met, a reduction in RTP, periodic reverification of shutdown margin, verification that heat flux and nuclear enthalpy rise hot channel factors are within limits, and safety analyses must be reevaluated to confirm results remain valid for duration of operation under these conditions. If more than one rod is not within the alignment limit, the SDM must be determined by verifying that the shutdown margin is within limits or by initiating boration to restore required SDM and plant shutdown is required.

3.3.3 Evaluation of Changes to SRs 3.1.4.2.1 and 3.1.7.2.1

The NRC staff reviewed the technical justification for the proposed changes provided in TSTF-547 for logical reasoning, completeness, and clarity. The purpose of the changes is to prescribe the appropriate actions to be followed when equipment is inoperable.

TS 3.1.4.2 provides limits on rod alignment to ensure acceptable power peaking factors and local linear heat rates and an acceptable shutdown margin, all of which are initial conditions in the applicable safety analyses. It is appropriate to consolidate requirements associated with rod misalignments in this TS. TS 3.1.7.2 provides requirements for instrumentation to monitor rod position. The instrumentation is used to verify that the rod alignment limits in TS 3.1.4.2 are satisfied. Similarly, it is appropriate to consolidate requirements associated with instrumentation operability in this TS.

The NRC staff concludes that the clarifications to SRs 3.1.4.2.1 and 3.1.7.2.1 to specify configurations in which performance of the SRs is not required are appropriate. The TSs, as modified, continue to specify the minimum performance level of equipment needed for safe operation of the facility as an LCO and continue to specify the appropriate remedial measures if the LCO is not met. The revised SRs 3.1.4.2.1 and 3.1.7.2.1 continue to be appropriate because they ensure the necessary quality of systems is maintained. The NRC staff finds that the requirements of 10 CFR 50.36(c)(2) and (c)(3) continue to be met.

3.4 Eliminate an Unnecessary RA from LCO 3.1.7.2 Review

The NRC staff reviewed the justification for deletion of LCO 3.1.7.2 RA B.2 that monitors and records reactor coolant average temperature (T_{avg}). RA B.2 is one of the RAs associated with LCO 3.1.7.2 Condition B. Condition B applies when more than one DRPI per group is inoperable in one or more groups. RA B.1 requires that the control rods be placed in manual control immediately, and existing RA B.4 (renumbered as B.2) requires restoring the inoperable position indicators to operable status such that a maximum of one DRPI per group is inoperable within 24 hours.

The NRC staff has determined that RA B.2 provides no safety benefit for identifying trends in reactor coolant T_{avg} . This RA was intended to help assure that significant changes in power distribution and the ability to shut down the reactor are avoided. During normal steady state power operation, there is very little rod motion. LCO 3.1.7.2 RA B.1 and RA B.4 (renumbered as RA B.2) continue to apply when more than one DRPI per group is inoperable. LCO 3.1.4.2 and LCO 3.1.7.2 provide the appropriate requirements for monitoring rod position and alignment and provide the appropriate actions if a rod is misaligned. This provides the necessary verification that SDM is maintained. The nuclear instrumentation monitors neutron flux in the core providing indication of changes in power distribution. Therefore, the NRC staff concludes that RA B.2 of LCO 3.1.7.2 is unnecessary and can be deleted.

The NRC staff concludes that the proposed changes to LCO 3.1.7.2 are acceptable because the LCO continues to specify the minimum performance level of equipment needed for safe operation of the facility. As described in the preceding paragraph, the appropriate remedial measures are prescribed when the LCO is not met. SRs are not being changed by the deletion of RA B.2. The NRC staff finds that the requirements of 10 CFR 50.36(c)(2) continue to be met.

3.5 Other Proposed Changes

The NRC staff found that the following changes are editorial in nature and do not change the TS requirements and are, therefore, acceptable.

1. LCO 3.1.4.2 Condition B is revised to eliminate RA B.1 and to combine RAs B.2.4 and B.2.5. Condition B applies when one rod is not within the alignment limits and RA B.1 requires restoring the rod to within limits within 1 hour. An alternative set of RAs is provided in the RA section and will continue to be required when Condition B is applicable. RA B.1 is an action that requires restoration of equipment such that the condition does not apply. Restoring equipment to operable status is understood to be an option. Therefore, stating this as an RA is not necessary. Combining RAs B.2.4 and B.2.5 simplifies the presentation and does not represent a technical change.
2. LCO 3.1.5 and LCO 3.1.6 contain a note modifying their applicability that states, "This LCO is not applicable while performing SR 3.1.4.2." The proposed change moves the LCO 3.1.5 and LCO 3.1.6 applicability Notes to LCO Notes and revises the Notes to state, "Not applicable to shutdown banks inserted while performing SR 3.1.4.2.2" for LCO 3.1.5.2 and "Not applicable to control banks inserted while performing SR 3.1.4.2.2" for LCO 3.1.6.2. This change clarifies the Note and does not alter its meaning.
3. TS 3.1.7.2 is revised to consistently use the defined abbreviation "DRPI." This improves the presentation of the requirements.
4. TS 3.1.7.2 Condition A is revised from "for one or more groups" to the more standard terminology "in one or more groups," and TS 3.1.7.2 Condition B is revised to include the phrase "in one or more groups" to be more consistent with the wording of Condition A.
5. TS 3.1.7.2 RA B.3 is redundant to RA A.1. RA B.3 is proposed to be deleted. Condition A applies when one DRPI per group is inoperable, and Condition B applies when more than one DRPI per group is inoperable. Each entry into Condition B also requires entry into Condition A. Restating the RA is not necessary.
6. TS 3.1.7.2 Condition C is revised to contain similar terminology to Conditions A and B. The existing Condition C states, "One or more rods with inoperable position indicators have been moved in excess of 24 steps in one direction since the last determination of the rod's position." Conditions A and B are worded such that the condition describing the inoperable equipment (e.g., "One DRPI per group inoperable...") is listed first. The proposed change rewords Condition C to state, "One or more DRPI inoperable in one or more groups and associated rods has been moved > 24 steps in one direction since the last determination of the rod's position."
7. LCO 3.1.7.2 Condition D is revised from "One demand position indicator per bank inoperable for one or more banks" to "One or more demand position indicators per bank

inoperable in one or more banks.” The proposed change makes the terminology consistent with the Note modifying the RAs.

8. The current TS 3.1.7.2 is modified by a Note which states, “Separate Condition entry is allowed for each inoperable rod position indicator and each demand position indicator.” The bases for the Note states that the Note is acceptable because the RAs for each condition provide appropriate compensatory actions for each inoperable indicator.
9. There is one demand position indicator per group of rods, two demand indicators per bank, in those banks with two groups. The separate condition entry Note modifying the TS 3.1.7 actions states that separate condition entry is allowed for inoperable demand position indicators, which means that Condition D is applicable to more than one inoperable demand position indicator per bank. The proposed change makes the existing Condition D terminology consistent with the Note.

The regulation at 10 CFR 50.36(a)(1) states, in part: “A summary statement of the bases or reasons for such specifications ... shall also be included in the application, but shall not become part of the technical specifications.” Accordingly, along with the proposed TS changes, the licensee also submitted TS bases changes that corresponded to the proposed STS changes for information only.

3.6 Variations from TSTF-547 and Additional Beaver Valley, Unit No. 1, Changes

The NRC staff reviewed the variations from the TSTF and the additional Beaver Valley, Unit No. 1, changes proposed by the licensee. The NRC staff determined that the variations are editorial in nature and do not impact the applicability or the conclusions presented in the NRC’s safety evaluation of TSTF-547. The changes are, therefore, acceptable.

3.7 Summary of NRC Staff Conclusions

The regulations at 10 CFR 50.36 require that TSs will include items in specified categories, including LCOs and SRs. The proposed changes modify the LCOs, conditions, RAs, completion times, and SRs applicable to control rod and shutdown rod insertion and alignment limits and the instrumentation to monitor rod position and alignment. The TSs continue to specify the LCOs and specify the remedial measures to be taken if one of these requirements is not satisfied. The TSs continue to specify the appropriate SRs for tests and inspections to ensure the necessary quality of affected structures, systems, and components is maintained. The NRC staff finds that the proposed LCOs and SRs meet the requirements of 10 CFR 50.36(c)(2) and (c)(3), respectively.

4.0 STATE CONSULTATION

In accordance with the Commission’s regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments on August 10, 2017. The State official had no comments.

5.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION

The NRC’s regulation at 10 CFR 50.92(c) states that the NRC may make a final determination under the procedures in 10 CFR 50.91 that a license amendment involves no significant hazards consideration if operation of the facility, in accordance with the amendment, would not:

(1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

An evaluation of the issue of no significant hazards consideration is presented below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

Control and shutdown rods are assumed to insert into the core to shut down the reactor in evaluated accidents. Rod insertion limits ensure that adequate negative reactivity is available to provide the assumed shutdown margin (SDM). Rod alignment and overlap limits maintain an appropriate power distribution and reactivity insertion profile.

Control and shutdown rods are initiators to several accidents previously evaluated, such as rod ejection. The proposed change does not change the limiting conditions for operation for the rods or make any technical changes to the Surveillance Requirements (SRs) governing the rods. Therefore, the proposed change has no significant effect on the probability of any accident previously evaluated.

Revising the TS Actions to provide a limited time to repair rod movement control has no effect on the SDM assumed in the accident analysis as the proposed Actions require verification that SDM is maintained. The effects on power distribution will not cause a significant increase in the consequences of any accident previously evaluated as all TS requirements on power distribution continue to be applicable.

Revising the TS Actions to provide an alternative to frequent use of the moveable incore detector system to verify the position of rods with inoperable rod position indicator does not change the requirement for the rods to be aligned and within the insertion limits.

Therefore, the assumptions used in any accidents previously evaluated are unchanged and there is no significant increase in the consequences.

The proposed change to resolve the conflicts in the TS ensure that the intended Actions are followed when equipment is inoperable. Actions taken with inoperable equipment are not assumptions in the accidents previously evaluated and have no significant effect on the consequences.

The proposed change to eliminate an unnecessary action has no effect on the consequences of accidents previously evaluated as the analysis of those accidents did not consider the use of the action.

The proposed change to increase consistency within the TS has no effect on the consequences of accidents previously evaluated as the proposed

change clarifies the application of the existing requirements and does not change the intent.

The proposed change to renumber the TS and make other supporting changes has no effect on the probability or consequences of previously evaluated accidents.

Therefore, the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any previously evaluated?

Response: No.

The proposed change does not involve a physical alteration of the plant (that is, no new or different type of equipment will be installed). The change does not alter assumptions made in the safety analyses. The proposed change does not alter the limiting conditions for operation for the rods or make any technical changes to the SRs governing the rods.

The proposed change to actions maintains or improves safety when equipment is inoperable and does not introduce new failure modes.

The proposed change to renumber the TS and make other supporting changes will not create the possibility of a new or different kind of accident from those previously evaluated.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No.

The proposed change to allow an alternative method of verifying rod position has no effect on the safety margin as actual rod position is not affected. The proposed change to provide time to repair rods that are Operable but immovable does not result in a significant reduction in the margin of safety because all rods must be verified to be Operable, and all other banks must be within the insertion limits.

The remaining proposed changes to make the requirements internally consistent and to eliminate unnecessary actions do not affect the margin of safety as the changes do not affect the ability of the rods to perform their specified safety function.

The proposed change to renumber the TS and make other supporting changes has no effect on a margin of safety.

Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

Based on the above evaluation, the NRC staff concludes that the three standards of 10 CFR 50.92(c) are satisfied. Therefore, the NRC staff has made a final determination that no significant hazards consideration is involved for the proposed amendments and that the amendments should be issued as allowed by the criteria contained in 10 CFR 50.91.

6.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve 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 amendments involve no significant hazards consideration, and there has been no public comment on such finding on July 11, 2017 (82 FR 32017). Accordingly, the amendments meet 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 amendments.

7.0 CONCLUSION

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

Principal Contributor: M. Chernoff

Date: August 16, 2017

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2 – ISSUANCE OF AMENDMENTS TO ADOPT TECHNICAL SPECIFICATIONS TASK FORCE (TSTF) TRAVELER TSTF-547, REVISION 1 (CAC NOS. MF9887 AND MF9888) DATED AUGUST 16, 2017

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