



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

August 30, 2018

Mr. Joseph W. Shea
Vice President, Nuclear Regulatory
Affairs and Support Services
Tennessee Valley Authority
1101 Market Street, LP 4A
Chattanooga, TN 37402-2801

**SUBJECT: SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2; WATTS BAR NUCLEAR
PLANT, UNITS 1 AND 2 – ISSUANCE OF AMENDMENTS REGARDING
REQUEST TO CHANGE TECHNICAL SPECIFICATION 3.3.1 AND
SURVEILLANCE REQUIREMENT 3.2.4 (EPID L-2017-LLA-0287)**

Dear Mr. Shea:


The Nuclear Regulatory Commission has issued the enclosed amendments:

1. Amendment Nos. 343 and 336 to Renewed Facility Operating License Nos. DPR-77 and DPR-79 for Sequoyah Nuclear Plant, Units 1 and 2, respectively
2. Amendment Nos. 122 and 21 to Facility Operating License Nos. NPF-90 and NPF-96 for the Watts Bar Nuclear Plant, Units 1 and 2, respectively.

These amendments are in response to your application dated August 7, 2017, as supplemented by letter dated February 8, 2018. The amendments revise the Technical Specification Limiting Condition for Operation 3.3.1 and Surveillance Requirement 3.2.4.2 related to the reactor trip system instrumentation for all four units.

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

Sincerely,



Andrew Hon, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-327, 50-328
50-390, 50-391

Enclosures:

1. Amendment No. 343 to DPR-77
2. Amendment No. 336 to DPR-79
3. Amendment No. 122 to NPF-90
4. Amendment No. 21 to NPF-96
5. Safety Evaluation

cc: Listserv



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-327

SEQUOYAH NUCLEAR PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 343
Renewed License No. DPR-77

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Tennessee Valley Authority (the licensee), August 7, 2017, and as supplemented by letters dated February 8, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, as amended; the provisions of the Act; and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-77 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 343 are hereby incorporated into this renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance, and shall be implemented no later than 30 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read 'Booma Venkataraman', with the word 'for' written in smaller cursive to its right.

Booma Venkataraman, Acting Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Operating License
and Technical Specifications

Date of Issuance: August 30, 2018

ATTACHMENT TO LICENSE AMENDMENT NO. 343
TO RENEWED FACILITY OPERATING LICENSE NO. DPR-77
SEQUOYAH NUCLEAR PLANT, UNIT 1
DOCKET NO. 50-327

Replace page 3 of Renewed Facility Operating License No. DPR-77 with the attached revised page 3. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

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

3.2.4-3

3.3.1-2

INSERT

3.2.4-3

3.3.1-2

- (3) 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) 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
- (5) 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 Sequoyah and Watts Bar Unit 1 Nuclear Plants.

C. This renewed license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth 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 Tennessee Valley Authority is authorized to operate the facility at reactor core power levels not in excess of 3455 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 343 are hereby incorporated into this renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Initial Test Program

The Tennessee Valley Authority shall conduct the post-fuel-loading initial test program (set forth in Section 14 of Tennessee Valley Authority's Final Safety Analysis Report, as amended), without making any major modifications of this program unless modifications have been identified and have received prior NRC approval. Major modifications are defined as:

- a. Elimination of any test identified in Section 14 of TVA's Final Safety Analysis Report as amended as being essential;
- b. Modification of test objectives, methods, or acceptance criteria for any test identified in Section 14 of TVA's Final Safety Analysis Report as amended as being essential;

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to $\leq 50\%$ RTP.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.2.4.1</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. With input from one Power Range Neutron Flux channel inoperable and THERMAL POWER $\leq 75\%$ RTP, the remaining three power range channels can be used for calculating QPTR. 2. SR 3.2.4.2 may be performed in lieu of this Surveillance. <p>-----</p> <p>Verify QPTR is within limit by calculation.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.2.4.2</p> <p>-----NOTE-----</p> <p>Only required to be performed if input to QPTR from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER $> 75\%$ RTP.</p> <p>-----</p> <p>Verify QPTR is within limit using the movable incore detectors.</p>	<p>Once within 12 hours</p> <p><u>AND</u></p> <p>In accordance with the Surveillance Frequency Control Program</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	C.2.2 Place the Rod Control System in a condition incapable of rod withdrawal.	49 hours
D. One Power Range Neutron Flux - High channel inoperable.	<p>-----NOTES-----</p> <p>1. The inoperable channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels.</p> <p>2. Perform SR 3.2.4.2 if input to QPTR from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% RTP.</p> <p>-----</p>	
	D.1 Place channel in trip.	72 hours
	<p><u>OR</u></p> <p>D.2 Be in MODE 3.</p>	78 hours



UNITED STATES
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TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-328

SEQUOYAH NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 336
Renewed License No. DPR-79

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Tennessee Valley Authority (the licensee), August 7, 2017, and as supplemented by letters dated February 8, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, as amended; the provisions of the Act; and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-79 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 336 are hereby incorporated into this renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance, and shall be implemented no later than 30 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Booma Venkataraman, Acting Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Operating License
and Technical Specifications

Date of Issuance: August 30, 2018

ATTACHMENT TO LICENSE AMENDMENT NO. 336
TO RENEWED FACILITY OPERATING LICENSE NO. DPR-79
SEQUOYAH NUCLEAR PLANT, UNIT 2
DOCKET NO. 50-328

Replace page 3 of Renewed Facility Operating License No. DPR-79 with the attached revised page 3. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

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

3.2.4-3
3.3.1-2

INSERT

3.2.4-3
3.3.1-2

- (3) 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) 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
- (5) 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 Sequoyah and Watts Bar Unit 1 Nuclear Plants.

C. This renewed license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth 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 Tennessee Valley Authority is authorized to operate the facility at reactor core power levels not in excess of 3455 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 336 are hereby incorporated into this renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Initial Test Program

The Tennessee Valley Authority shall conduct the post-fuel-loading initial test program (set forth in Section 14 of Tennessee Valley Authority's Final Safety Analysis Report, as amended), without making any major modifications of this program unless modifications have been identified and have received prior NRC approval. Major modifications are defined as:

- a. Elimination of any test identified in Section 14 of TVA's Final Safety Analysis Report as amended as being essential;
- b. Modification of test objectives, methods, or acceptance criteria for any test identified in Section 14 of TVA's Final Safety Analysis Report as amended as being essential;

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to $\leq 50\%$ RTP.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.2.4.1</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. With input from one Power Range Neutron Flux channel inoperable and THERMAL POWER $\leq 75\%$ RTP, the remaining three power range channels can be used for calculating QPTR. 2. SR 3.2.4.2 may be performed in lieu of this Surveillance. <p>-----</p> <p>Verify QPTR is within limit by calculation.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.2.4.2</p> <p>-----NOTE-----</p> <p>Only required to be performed if input to QPTR from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER $> 75\%$ RTP.</p> <p>-----</p> <p>Verify QPTR is within limit using the movable incore detectors.</p>	<p>Once within 12 hours</p> <p><u>AND</u></p> <p>In accordance with the Surveillance Frequency Control Program</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	C.2.2 Place the Rod Control System in a condition incapable of rod withdrawal.	49 hours
D. One Power Range Neutron Flux - High channel inoperable.	<p>-----NOTES-----</p> <p>1. The inoperable channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels.</p> <p>2. Perform SR 3.2.4.2 if input to QPTR from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% RTP.</p> <p>-----</p>	
	D.1 Place channel in trip.	72 hours
	<p><u>OR</u></p> <p>D.2 Be in MODE 3.</p>	78 hours



UNITED STATES
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TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-390

WATTS BAR NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 122
License No. NPF-90

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Tennessee Valley Authority (the licensee), August 7, 2017, and as supplemented by letters dated February 8, 2018, 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, Facility Operating License No. NPF-90 is hereby amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-90 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 122 are hereby incorporated into this renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance, and shall be implemented no later than 30 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Booma Venkataraman, Acting Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Operating License
and Technical Specifications

Date of Issuance: August 30, 2018

ATTACHMENT TO AMENDMENT NO. 122

WATTS BAR NUCLEAR PLANT, UNIT 1

FACILITY OPERATING LICENSE NO. NPF-90

DOCKET NO. 50-390

Replace Page 3 of Facility Operating License No. NPF-90 with the attached revised Page 3. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

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

3.2-12

3.3-2

INSERT

3.2-12

3.3-2

TVA, 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, instrument calibration, or other activity associated with radioactive apparatus or components; and

- (5) TVA, 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 license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth 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

TVA is authorized to operate the facility at reactor core power levels not in excess of 3459 megawatts thermal.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A as revised through Amendment No. 122 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. TVA shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Safety Parameter Display System (SPDS) (Section 18.2 of SER Supplements 5 and 15)

Prior to startup following the first refueling outage, TVA shall accomplish the necessary activities, provide acceptable responses, and implement all proposed corrective actions related to having the Watts Bar Unit 1 SPDS operational.

(4) Vehicle Bomb Control Program (Section 13.6.9 of SSER 20)

During the period of the exemption granted in paragraph 2.D.(3) of this license, in implementing the power ascension phase of the approved initial test program, TVA shall not exceed 50% power until the requirements of 10 CFR 73.55(c)(7) and (8) are fully implemented. TVA shall submit a letter under oath or affirmation when the requirements of 73.55(c)(7) and (8) have been fully implemented.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.2.4.1</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. With input from one power range neutron flux channel inoperable and THERMAL POWER $\leq 75\%$ RTP, the remaining three power range channels can be used for calculating QPTR. 2. SR 3.2.4.2 may be performed in lieu of this Surveillance if adequate power range neutron flux channel inputs are not OPERABLE. <p>-----</p> <p>Verify QPTR is within limit by calculation.</p>	<p>7 days</p> <p><u>AND</u></p> <p>Once within 12 hours and every 12 hours thereafter with the QPTR alarm inoperable</p>
<p>SR 3.2.4.2</p> <p>-----NOTE-----</p> <p>Only required to be performed if input to QPTR from one or more power range neutron flux channels are inoperable with THERMAL POWER $> 75\%$ RTP.</p> <p>-----</p> <p>Verify QPTR is within limit using either the movable incore detectors or the PDMS.</p>	<p>Once within 12 hours</p> <p><u>AND</u></p> <p>12 hours thereafter</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One channel or train inoperable.	C.1 Restore channel or train to OPERABLE status.	48 hours
	<u>OR</u> C.2 Open RTBs.	49 hours
D. One Power Range Neutron Flux — High channel inoperable.	<p>-----NOTES-----</p> <p>1. The inoperable channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels</p> <p>2. Perform SR 3.2.4.2 if input to QPTR from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% RTP.</p> <p>-----</p>	
	D.1 Place channel in trip.	72 hours
	<u>OR</u> D.2 Be in MODE 3.	78 hours

(continued)



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-391

WATTS BAR NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 21
License No. NPF-96

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Tennessee Valley Authority (the licensee), August 7, 2017, and as supplemented by letters dated February 8, 2018, 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, Facility Operating License No. NPF-96 is hereby amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-96 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 21 are hereby incorporated into this renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance, and shall be implemented no later than 30 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Booma Venkataraman, Acting Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Operating License
and Technical Specifications

Date of Issuance: August 30, 2018

ATTACHMENT TO AMENDMENT NO. 21

WATTS BAR NUCLEAR PLANT, UNIT 2

FACILITY OPERATING LICENSE NO. NPF-96

DOCKET NO. 50-391

Replace Page 3 of Facility Operating License No. NPF-96 with the attached revised Page 3. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages and insert the attached new pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

3.2-11

3.3.-2

INSERT

3.2-11

3.3.-2

- C. The license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth 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

TVA is authorized to operate the facility at reactor core power levels not in excess of 3411 megawatts thermal.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A as revised through Amendment No. 21 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. TVA shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

- (3) TVA shall implement permanent modifications to prevent overtopping of the embankments of the Fort Loudon Dam due to the Probable Maximum Flood by June 30, 2018.
- (4) PAD4TCD may be used to establish core operating limits for Cycles 1 and 2 only. PAD4TCD may not be used to establish core operating limits for subsequent reload cycles.
- (5) By December 31, 2018, the licensee shall report to the NRC that the actions to resolve the issues identified in Bulletin 2012-01, "Design Vulnerability in Electrical Power System," have been implemented.
- (6) The licensee shall maintain in effect the provisions of the physical security plan, security personnel training and qualification plan, and safeguards contingency plan, and all amendments made pursuant to the authority of 10 CFR 50.90 and 50.54(p).
- (7) TVA shall fully implement and maintain in effect all provisions of the Commission approved cyber security plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The TVA approved CSP was discussed in NUREG-0847, Supplement 28, as amended by changes approved in License Amendment No. 7.
- (8) TVA shall implement and maintain in effect all provisions of the approved fire protection program as described in the Fire Protection Report for the facility, as described in NUREG-0847, Supplement 29, subject to the following provision:

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.2.4.1 -----NOTES-----</p> <p>a. With input from one power range neutron flux channel inoperable and THERMAL POWER $\leq 75\%$ RTP, the remaining three power range channels can be used for calculating QPTR.</p> <p>b. SR 3.2.4.2 may be performed in lieu of this Surveillance if adequate power range neutron flux channel inputs are not OPERABLE.</p> <p>-----</p> <p>Verify QPTR is within limit by calculation.</p>	<p>7 days</p> <p><u>AND</u></p> <p>Once within 12 hours and every 12 hours thereafter with the QPTR alarm inoperable</p>
<p>SR 3.2.4.2 -----NOTE-----</p> <p>Only required to be performed if input to QPTR from one or more power range neutron flux channels are inoperable with THERMAL POWER $> 75\%$ RTP.</p> <p>-----</p> <p>Verify QPTR is within limit using the PDMS.</p>	<p>Once within 12 hours</p> <p><u>AND</u></p> <p>every 12 hours thereafter</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One channel or train inoperable.	C.1 Restore channel or train to OPERABLE status.	48 hours
	<u>OR</u>	
	C.2 Open RTBs.	49 hours
D. One Power Range Neutron Flux-High channel inoperable.	-----NOTES----- 1. The inoperable channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels. 2. Perform SR 3.2.4.2 if input to QPTR from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% RTP.	
	D.1 Place channel in trip.	72 hours
	<u>OR</u>	
	D.2 Be in MODE 3.	78 hours

continued)



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NUMBERS 343 AND 336

TO RENEWED FACILITY LICENSE NUMBERS DPR-77 AND DPR-79

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NUMBERS 50-327 AND 50-328

AMENDMENT NUMBERS 122 AND 21

TO FACILITY LICENSE NUMBERS, DPR-90 AND DPR-96

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NUMBERS 50-390 AND 50-391

1.0 INTRODUCTION

By letter dated August 7, 2017 (Agencywide Documents and Management System (ADAMS) Accession No. ML17219A505), and as supplemented by letters dated February 8, 2018 (ADAMS Accession No. ML18040A482), Tennessee Valley Authority (TVA or the licensee) submitted a license amendment request (LAR) to change the Sequoyah Nuclear Plant (SQN), Units 1 and 2, and Watts Bar Nuclear Plant (WBN), Units 1 and 2 Facility Operating License Nos. DPR-77, DPR-79, NPF-90, and NPF-96 respectively. TVA proposed to revise the Technical Specification (TS) Limiting Condition for Operation (LCO) 3.3.1 and Surveillance Requirement (SR) 3.2.4.2 related to the reactor trip system instrumentation for all four units.

TVA stated that the revisions clarify TS action requirements to align flux mapping requirements by revising the TS LCO 3.3.1, Condition D, for one inoperable channel of power range neutron flux - high when the channel input to the quadrant power tilt ratio (QPTR) is inoperable. TVA also proposed to revise the Note in SR 3.2.4.2 to align flux mapping requirements in the two specifications for the SQN units. For the WBN units, TVA proposed to revise the signs in both SR 3.2.4.1 and SR 3.2.4.2 so that when and if thermal power is equal to 75 percent (%) QPTR is verified to be within limits by calculation. This additionally makes the TS 3.2.4 SRs consistent across all four units at the two sites.

The supplemental letter, dated February 8, 2018, provided additional information that clarified the application, did not expand the scope of the application as originally noticed and did not

change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on November 21, 2017 (82 FR 55416).

2.0 REGULATORY EVALUATION

2.1 System Description

The Reactor Trip System (RTS) Instrumentation initiates a unit shutdown, based on the values of selected unit parameters, to protect against violating the core fuel design limits and Reactor Coolant System pressure boundary during anticipated operational occurrences and to assist the Engineered Safety Features Systems in mitigating accidents. The protection and monitoring systems have been designed to assure safe operation of the reactor.

This is achieved by specifying limiting safety system settings in terms of parameters directly monitored by the RTS, as well as specifying LCOs on other reactor system parameters and equipment performance.

Power Range Neutron Flux Instrumentation

The nuclear instrumentation system (NIS) power range detectors consist of four long ion chambers located external to the reactor vessel core (excore) running parallel to the axis of the core. The NIS measures neutrons leaking from the core. Separate signals are taken from the top and bottom halves of the chambers. The NIS power range detectors provide input to the rod control system. The power range neutron flux - high trip function ensures that protection is provided, from all power levels, against a positive reactivity excursion leading to departure from nucleate boiling during power operations. These can be caused by rod withdrawal or reductions in reactor coolant system (RCS) temperature. The LCO requires all four of the power range neutron flux - high channels to be OPERABLE in Modes 1 and 2. The four sets of power range neutron flux instruments are equally spaced circumferentially outside the core in 4 radial quadrants. The output of each instrument is compared with the average. If a ratio greater than (>) 1.02 is calculated, an alarm for detector flux deviation is generated. This ratio is the TS limit for QPTR.

QPTR Limits

The QPTR limit ensures that the gross radial power distribution remains consistent with the design values used in the safety analyses. Precise radial power distribution measurements are made during startup testing, after refueling, and periodically during power operation. With an NIS power range channel inoperable, tilt monitoring for a portion of the reactor core becomes degraded. Large tilts are likely detected with the remaining channels, but the capability for detection of small power tilts in some quadrants is decreased. SR 3.2.4.2 usually (SQN, Units 1 and 2 and potentially WBN, Unit 1) involves using movable in-core detectors to perform a flux map. WBN, Units 1 or 2, may perform this function using the fixed in-core Power Distribution Monitoring System (PDMS) detectors. Performing SR 3.2.4.2 at a frequency of once within 12 hours or according to the frequency specified in the surveillance frequency control program provides an accurate alternative means for ensuring that any tilt remains within its limits.

For WBN, Units 1 and 2, in-core power distribution measurement information may be obtained from PDMS. The PDMS receives on-line values for power range neutron flux, reactor power, RCS cold leg temperatures, control bank positions, and core exit thermocouple temperatures coupled with a three-dimensional analytical model to yield a continuously measured

three-dimensional power distribution. WBN, Unit 2, does not use movable in-core detectors; therefore, SR 3.2.4.2 there can only be performed using PDMS. Whether movable in-core detectors or PDMS are used operators may obtain a precise measurement of power distribution with the performance of SR 3.2.4.2.

2.2 Proposed Changes to Technical Specifications (TSs)

2.2.1 For SQN, TVA proposes the following TS changes for which both current and revised TSs are shown below and evaluated in Section 3.1 of this safety evaluation (SE):

- The Note associated with SR 3.2.4.2 is revised to state "Only required to be performed if input to QPTR from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% RTP." The frequency for SR 3.2.4.2 is revised to be consistent with the intent of the current Note by stating "Once within 12 hours AND In accordance with the Surveillance Frequency Control Program."
- A new Note 2 is added to TS 3.3.1, Condition D to perform SR 3.2.4.2 if input to QPTR from one or more power range neutron flux channels are inoperable with thermal power > 75% rated thermal power (RTP). As a result, the existing Note becomes Note 1.
- TS 3.3.1 Required Actions D.1.2, D.2.1, and D.2.2 are deleted. The remaining Required Actions are renumbered as D.1 and D.2.

Current SQN SR 3.2.4.2:

-----NOTE----- Not required to be performed until 12 hours after input from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% RTP. -----	
Verify QPTR is within limit using the movable incore detectors.	In accordance with the surveillance frequency control program

Revised SQN SR 3.2.4.2:

-----NOTE----- Only required to be performed if input to QPTR from one or more power range neutron flux channels are inoperable with THERMAL POWER > 75% RTP. -----	
Verify QPTR is within limit using the movable incore detectors.	Once within 12 hours <u>AND</u> In accordance with the surveillance frequency control program

Current SQN TS 3.3.1 Condition D:

D. One Power Range Neutron Flux – High channel inoperable	-----NOTE----- The inoperable channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels. -----	
	D.1.1 Place channel in trip.	72 hours
	<u>AND</u>	
	D.1.2 Reduce THERMAL POWER to $\leq 75\%$ RTP.	78 hours
	<u>OR</u>	
	D.2.1 Place channel in trip.	72 hours
	<u>AND</u>	
	D.2.2 -----NOTE----- Only required to be performed when the Power Range Neutron Flux input to QPTR is inoperable. -----	
	Perform SR 3.2.4.2	Once per 12 hours
	<u>OR</u>	
	D.3 Be in Mode 3	78 hours

Revised SQN TS 3.3.1 Condition D:

D. One Power Range Neutron Flux – High channel inoperable	-----NOTES----- 1. The inoperable channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels. 2. Perform SR 3.2.4.2 if input to QPTR from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER $> 75\%$ RTP. -----	
	D.1 Place channel in trip.	72 hours
	<u>OR</u>	
	D.2 Be in Mode 3	78 hours

2.2.2 For WBN, TVA proposes the following TS changes for which both current and revised TSs are shown below and evaluated in Section 3.2 of this SE:

- Note 1 to SR 3.2.4.1 is revised to change "< 75% RTP" to "≤ 75% RTP."
- The Note associated with SR 3.2.4.2 is revised to be consistent with the proposed changes to TS 3.3.1, Condition D, by inserting "to QPTR" after "Only required to be performed if input." The "≥ 75% RTP" is revised to "> 75% RTP."
- A new Note 2 is added to TS 3.3.1, Condition D to perform to SR 3.2.4.2 if input to QPTR from one or more power range neutron flux channels are inoperable with thermal power > 75% RTP. As a result, the existing Note becomes Note 1.
- TS 3.3.1 Required Actions D.1.2, D.2.1, and D.2.2 are deleted. The remaining Required Actions are renumbered as D.1 and D.2.

Current WBN SR 3.2.4.1 (both units):

<p>-----NOTE-----</p> <p>1. With input from one power range neutron flux channel inoperable and THERMAL POWER < 75% RTP, the remaining three power range channels can be used for calculating QPTR.</p> <p>2. SR 3.2.4.2 may be performed in lieu of this Surveillance if adequate power range neutron flux channel inputs are not OPERABLE.</p> <p>-----</p>	
<p>Verify QPTR is within limit by calculation.</p>	<p>7 days <u>AND</u> Once within 12 hours and every 12 hours thereafter with the QPTR alarm inoperable</p>

Revised WBN SR 3.2.4.1 (both units):

<p>-----NOTE-----</p> <p>1. With input from one power range neutron flux channel inoperable and THERMAL POWER \leq 75% RTP, the remaining three power range channels can be used for calculating QPTR.</p> <p>2. SR 3.2.4.2 may be performed in lieu of this Surveillance if adequate power range neutron flux channel inputs are not OPERABLE.</p> <p>-----</p>	
Verify QPTR is within limit by calculation.	7 days <u>AND</u> Once within 12 hours and every 12 hours thereafter with the QPTR alarm inoperable

Current WBN Unit 1, SR 3.2.4.2:

<p>-----NOTE-----</p> <p>Only required to be performed if input from one or more power range neutron flux channels are inoperable with THERMAL POWER \geq 75% RTP.</p> <p>-----</p>	
Verify QPTR is within limit using either the movable incore detectors or the PDMS.	Once within 12 hours <u>AND</u> 12 hours thereafter

Revised WBN Unit 1, SR 3.2.4.2:

<p>-----NOTE-----</p> <p>Only required to be performed if input to QPTR from one or more power range neutron flux channels are inoperable with THERMAL POWER $>$ 75% RTP.</p> <p>-----</p>	
Verify QPTR is within limit using either the movable incore detectors or the PDMS.	Once within 12 hours <u>AND</u> 12 hours thereafter

Current WBN Unit 2, SR 3.2.4.2:

<p>-----NOTE-----</p> <p>Only required to be performed if input from one or more power range neutron flux channels are inoperable with THERMAL POWER \geq 75% RTP.</p> <p>-----</p>	
Verify QPTR is within limit using the PDMS.	Once within 12 hours <u>AND</u> every 12 hours thereafter

Revised WBN Unit 2, SR 3.2.4.2:

<p>-----NOTE-----</p> <p>Only required to be performed if input from one or more power range neutron flux channels are inoperable with THERMAL POWER $>$ 75% RTP.</p> <p>-----</p>	
Verify QPTR is within limit using the PDMS.	Once within 12 hours <u>AND</u> every 12 hours thereafter

Current WBN TS 3.3.1 Condition D (both units):

D. One Power Range Neutron Flux – High channel inoperable	<p>-----NOTE-----</p> <p>The inoperable channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels.</p> <p>-----</p>	
	D.1.1 Place channel in trip.	72 hours
	<u>AND</u>	
	D.1.2 Reduce THERMAL POWER to \leq 75% RTP.	78 hours
	<u>OR</u>	
	D.2.1 Place channel in trip.	72 hours
	<u>AND</u>	
	<p>-----NOTE-----</p> <p>Only required to be performed when the Power Range Neutron Flux input to QPTR is inoperable.</p> <p>-----</p>	
	D.2.2 Perform SR 3.2.4.2	Once per 12 hours
	<u>OR</u>	
	D.3 Be in Mode 3	78 hours

Revised WBN TS 3.3.1 Condition D (both units):

D. One Power Range Neutron Flux – High channel inoperable	-----NOTE----- 1. The inoperable channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels. 2. Perform SR 3.2.4.2 if input to QPTR from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% -----	
	D.1 Place channel in trip.	72 hours
	OR	
	D.2 Be in Mode 3	78 hours

The licensee stated the following as reasons for the changes on page E4 of the Enclosure to the LAR:

The potential for confusion exists with the current wording of TS 3.3.1, Condition D. Specifically, TS 3.3.1, Condition D could result in the option of only performing Required Actions D.1.1 and D.1.2, potentially overlooking the requirement to do an in-core power distribution measurement for QPTR within 12 hours. The proposed revision to TS 3.3.1, Condition D includes the current Note (i.e., the inoperable channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels), while including a new Note to perform SR 3.2.4.2 if input to QPTR from one or more power range neutron flux channels are inoperable with thermal power > 75% RTP. The proposed revision to SR 3.2.4.2 is to achieve consistency with the proposed changes to TS 3.3.1, Condition D.

The proposed revision to WBN Units 1 and 2 SR 3.2.4.1, Note 1, is to achieve consistency with the current and proposed changes to TS 3.3.1, Condition D, the existing Note 1 in SQN Units 1 and 2 SR 3.2.4.1, and the Westinghouse Standard TS in NUREG-1431, Revision 4.

2.3 Regulatory Requirements

In Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 36, the U.S. Nuclear Regulatory Commission (NRC or Commission) established its regulatory requirements related to the content of TSs. Specifically the following paragraphs apply to the proposed changes:

- 10 CFR 50.36(c)(2)(i), Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial actions permitted by the technical specifications. . . .

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

2.4 Regulatory Guidance

NUREG-1431, "Standard Technical Specifications, Westinghouse Plants," Revision 4.0, dated April 2012 (ADAMS Accession No ML12100A222) applies to the proposed changes.

Federal Register notice (58 FR 39132), "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors," July 22, 1993.

NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Chapter 16, "Technical Specifications," Revision 3, March 2010.

3.0 TECHNICAL EVALUATION

In general, a licensee cannot justify TS changes solely on the basis of adopting the model Standard Technical Specifications (STs). Changes that result in relaxation (less restrictive conditions) of TS requirements require detailed justification. When requirements have been shown to give little or no safety benefit, their relaxation or removal from the TSs may be appropriate.

Other changes made to adopt the model STs are new, more conservative requirements than corresponding requirements in the current TSs (CTSs), or have additional restrictions that are not in the CTSs but are in the STs. The NRC staff evaluates the additional restrictions on plant operation to ensure that they enhance safety. Additionally, non-technical (administrative) TS changes that incorporated human factors principles for the preferred format into the form and structure of the TSs so that plant operations personnel can use them more easily were evaluated by the NRC staff. These changes are editorial in nature or involve the reorganization or reformatting of CTS requirements without affecting technical content or operational restrictions. The changes proposed by TVA to the SQN, Units 1 and 2, and WBN, Units 1 and 2, TSs as described herein are administrative unless noted otherwise.

Consequently, licensees making application to change plant-specific TS requirements, even though the changes are modeled after STs, must include a plant-specific justification that is found to be acceptable to the NRC staff for complying with the requirements of 10 CFR 50.36.

3.1 SQN, Units 1 and 2

3.1.1 Proposed Changes to TS 3.3.1

Reactor Trip System Instrumentation, LCO 3.3.1, Condition D, applies to one power range neutron flux - high channel inoperable. Condition D provides Required Actions D.1.1 and D.1.2 or, D.2.1 and D.2.2, or, Required Action D.3, which requires placing the unit in Mode 3. Either of the paired required actions (D.1.1/D.1.2 or D.2.1/D.2.2) permit continued operation with the inoperable channel as long as both required actions in the pair are met.

Required Actions D.1.1 and D.1.2 Changes

With one power range neutron flux - high channel inoperable, Required Action D.1.1 allows 72 hours to place the inoperable channel in trip. In addition to placing the inoperable channel in the tripped condition, thermal power must be reduced to $\leq 75\%$ rated thermal power (RTP) within 78 hours per Required Action D.1.2.

In the time period between when the channel is known to be inoperable and before thermal power is reduced to $\leq 75\%$ RTP, current TSs would also require performance of SR 3.2.4.2 after 12 hours and per the surveillance frequency control program thereafter. Performing SR 3.2.4.2 confirms that the normalized symmetric power distribution is consistent with QPTR. Upon meeting the requirements of Required Action D.1.2, the requirements of SR 3.2.4.2 are no longer required to be performed because reducing the power level to $\leq 75\%$ RTP (Required Action D.1.2) prevents operation of the core with radial power distributions beyond the design limits even though with one NIS power range detector inoperable, one-fourth of the radial power distribution monitoring capability is lost.

The NRC staff reviewed the proposed D.1.1 and D.1.2 changes. The requirement to place the inoperable NIS channel in trip within 72 hours is retained as new Required Action D.1. This results in a partial trip condition requiring only one-out-of-three logic for actuation of the reactor protection system. Deleting Required Action D.1.2 eliminates the requirement to reduce THERMAL POWER to $\leq 75\%$ RTP. Reducing thermal power to $\leq 75\%$ RTP is an unnecessary complication based on the proposed revision to SR 3.2.4.2 since the new surveillance note requires performing SR 3.2.4.2 when the NIS channel input to QTPR is inoperable. Performing SR 3.2.4.2 at the specified once within 12-hour frequency and thereafter in accordance with the surveillance frequency control program will be an accurate alternative means for ensuring that any core power tilt remains within core operating limits, thus adequate protection will be assured.

The NRC staff finds these changes acceptable because the partial trip condition requirement is retained, thus ensuring the core is protected against a positive reactivity excursion leading to departure from nucleate boiling during power operations, and the SR 3.2.4.2 Note changes (discussed below in Section 3.2.2) to perform SR 3.2.4.2 only when power range neutron flux - high channel QPTR inputs are inoperable above 75% RTP ensure the core power distributions will not exceed design limits.

The NRC staff finds deleting Required Action D.1.2 acceptable because the requirements that remain are equivalent to the STSSs, do not result in any substantive change in operating requirements, and are consistent with the Commission's regulations. These changes will provide for a consistent application of the TS actions and required tests.

Required Actions D.2.1 and D.2.2 Changes

With one power range neutron flux - high channel inoperable, Required Action D.2.1 allows 72 hours to place the inoperable channel in trip. In addition to placing the inoperable channel in the tripped condition, Required Action D.2.2 provides the appropriate action for the condition when the NIS channel input to QPTR is also inoperable (at any power level) by requiring performance of SR 3.2.4.2 once per 12 hours.

The NRC staff reviewed the proposed D.2.1 and D.2.2 changes. D.2.1 is deleted, but the requirement to place the inoperable NIS channel in trip within 72 hours is retained as new

Required Action D.1. This would result in a partial trip condition requiring only one-out-of-three logic for actuation. D.2.2 is deleted. Retaining this requirement would essentially duplicate equivalent flux mapping requirements that are included with SR 3.2.4.2 when the NIS channel QPTR inputs are inoperable above 75% RTP. Flux mapping requirements do not apply at or below 75% RTP when the NIS channel QPTR inputs are inoperable. The licensee stated that the existing layout of LCO 3.3.1, Condition D, could incorrectly lead an operator to believe that only the options of D.1.1 and D.1.2 could apply, potentially overlooking the requirement to do a flux map for QPTR within 12 hours.

The NRC staff finds that replacing D.2.1 with D.1 and deleting Required Action D.2.2 are acceptable because the requirements that remain are equivalent to the STSs, do not result in any substantive changes in operating requirements, and are consistent with the Commission's regulations. These changes will provide for a consistent application of the TS actions and required tests.

Addition of Note 2 to Required Action D

Required Action D is revised by inserting a note directing operators to perform SR 3.2.4.2 if the input to QPTR from one or more power range neutron flux channels is inoperable with > 75% RTP.

The reference to perform SR 3.2.4.2 replaces the need to specify performing SR 3.2.4.2 requirements in Required Action D.2.2 when the NIS input to QPTR is inoperable. This is acceptable because D.2.2 restates the requirements of SR 3.2.4.2 to calculate QPTR every 12 hours as compensation for lost monitoring capability due to an inoperable NIS channel input to QPTR for thermal power > 75% RTP. This proposed change will help eliminate potential confusion regarding the completion time to perform SR 3.2.4.2.

The NRC staff reviewed all of the administrative changes proposed by TVA to eliminate the potential confusion regarding duplicating the requirement to perform SR 3.2.4.2 and finds them acceptable because they are equivalent to the STSs, do not result in any substantive changes in operating requirements, and are consistent with the Commission's regulations. These changes will provide for a consistent application of the TS actions and required tests.

3.1.2 Proposed SR 3.2.4.2 Changes

The existing note to SR 3.2.4.2 limits performing this SR to 12 hours after input from one or more power range neutron flux channels are inoperable with THERMAL POWER > 75% RTP. The note is clarified in two ways.

The time period of 12 hours is relocated from the note to the frequency column as once within 12 hours. Adding the words "once within" before the time limit will ensure that initial occurrence of the appropriate actions are taken "within 12 hours" rather than "12 hours after" therefore making the change more conservative than the current SR 3.2.4.2 and having the change match the frequency requirements originally located in TS LCO 3.3.1, Required Action D.2.2.

Additionally, the language is changed to require performance only if the input to QPTR from one or more power range neutron flux - channels is inoperable with THERMAL POWER > 75% RTP. If the inoperable power range channels remain capable of providing a valid input to QPTR, there is no need to perform SR 3.2.4.2.

The NRC staff reviewed the modified portions of the note and the relocation of the time component of the note to the frequency column as proposed by TVA and finds the changes acceptable because they are compatible with the STSSs, do not result in any substantive change in operating requirements, and are consistent with the Commission's regulations. These changes will help eliminate potential confusion and provide for a consistent application of the TS remedial actions and required tests.

3.2 Staff Evaluation for WBN, Units 1 and 2

3.2.1 Proposed Changes to TS 3.3.1

Reactor Trip System Instrumentation, LCO 3.3.1, Condition D, applies to one power range neutron flux - high channel inoperable. Condition D provides Required Actions D.1.1 and D.1.2 or, D.2.1 and D.2.2, or, Required Action D.3, which requires placing the unit in Mode 3. Either of the paired required actions (D.1.1/D.1.2 or D.2.1/D.2.2) permit continued operation with the inoperable channel as long as both required actions in the pair are met.

Required Actions D.1.1 and D.1.2 Changes

With one power range neutron flux - high channel inoperable, Required Action D.1.1 allows 72 hours to place the inoperable channel in trip. In addition to placing the inoperable channel in the tripped condition, thermal power must be reduced to $\leq 75\%$ RTP within 78 hours per Required Action D.1.2.

In the time period between when the channel is known to be inoperable and before thermal power is reduced to $< 75\%$ RTP, current TSs would also require performance of SR 3.2.4.2 after 12 hours and every 12 hours thereafter. Performing SR 3.2.4.2 confirms that the normalized symmetric power distribution is consistent with QPTR. Upon meeting the requirements of Required Action D.1.2, the requirements of SR 3.2.4.2 are no longer required to be performed unless power is equal to 75%.

If power were maintained precisely equal to 75%, while meeting the requirements of Required Action D.1.2, SR 3.2.4.2 would continue to have to be performed. On page E6 of the enclosure to the LAR the licensee cites this as an administrative inconsistency within the WBN TSs and a reason for proposed changes to SRs 3.2.4.1 and 3.2.4.2.

Reducing the power level to $\leq 75\%$ RTP (Required Action D.1.2) prevents operation of the core with radial power distributions beyond the design limits even though with one NIS power range detector inoperable, 1/4 of the radial power distribution monitoring capability is lost.

The NRC staff reviewed the proposed D.1.1 and D.1.2 changes. The requirement to place the inoperable NIS channel in trip within 72 hours is retained as new Required Action D.1. This results in a partial trip condition requiring only one-out-of-three logic for actuation of the reactor protection system. Deleting Required Action D.1.2 eliminates the requirement to reduce THERMAL POWER to $\leq 75\%$ RTP. Reducing thermal power to $\leq 75\%$ RTP is an unnecessary complication based on the note to SR 3.2.4.2. The current note at SR 3.2.4.2 requires performing SR 3.2.4.2 when the NIS channel input to QTPR is inoperable for THERMAL POWER $\geq 75\%$. Performing SR 3.2.4.2 at the specified once within 12-hour frequency and 12 hours thereafter will be an accurate alternative means for ensuring that any core power tilt remains within core operating limits, thus adequate protection will be assured.

In the supplement dated February 8, 2018, in paragraph number 3 on page E2 of 2 of the Enclosure, TVA explained a conflict with the interface between TS 3.3.1, Condition D and the WBN, Units 1 and 2, SRs 3.2.4.1 and 3.2.4.2 when thermal power is maintained at precisely 75% RTP as follows:

Currently, there is a conflict between the requirements of WBN Units 1 and 2 TS 3.3.1, Condition D, and the requirements of WBN Units 1 and 2 SR 3.2.4.1, Note 1, and the Note in WBN Units 1 and 2 SR 3.2.4.2 regarding the required actions when thermal power is maintained exactly at 75% RTP. With an inoperable power range neutron flux channel and RTP equal to 75%, current WBN Units 1 and 2 TS 3.3.1, Required Action D.1.2 provides an alternative to performing SR 3.2.4.2 pursuant to WBN Units 1 and 2 TS 3.3.1, Required Action D.2.2. However, current WBN Units 1 and 2 SR 3.2.4.2 applies when a power range neutron flux channel is inoperable and thermal power is equal to 75% RTP. Therefore, the Note to WBN Units 1 and 2 SR 3.2.4.2 needs to be changed to > 75% RTP for consistency.

See the staff evaluation of the revisions to SRs 3.2.4.1 and 3.2.4.2 in Section 3.2.2 for further explanation of those changes.

The NRC staff finds the changes to Required Actions D.1.1 and D.1.2 acceptable because the partial trip condition requirement is retained, thus ensuring the core is protected against a positive reactivity excursion leading to departure from nucleate boiling during power operations, and the changes to the SR 3.2.4.2 note to perform SR 3.2.4.2 only when power range neutron flux - high channel QPTR inputs are inoperable above 75% RTP ensure the core power distributions will not exceed design limits.

The NRC staff finds deleting Required Action D.1.2 acceptable because the requirements that remain are equivalent to the STSs, do not result in any substantive change in operating requirements, and are consistent with the Commission's regulations. These changes will provide for a consistent application of the TS actions and required tests.

Required Actions D.2.1 and D.2.2 Changes

With one power range neutron flux - high channel inoperable, Required Action D.2.1 allows 72 hours to place the inoperable channel in trip. In addition to placing the inoperable channel in the tripped condition, Required Action D.2.2 provides the appropriate action for the condition when the NIS channel input to QPTR is also inoperable (at any power level) by requiring performance of SR 3.2.4.2 once per 12 hours.

The NRC staff reviewed the proposed D.2.1 and D.2.2 changes. D.2.1 is deleted, but the requirement to place the inoperable NIS channel in trip within 72 hours is retained as new Required Action D.1. This would result in a partial trip condition requiring only one-out-of-three logic for actuation. D.2.2 is deleted. Retaining this requirement would essentially duplicate equivalent flux mapping requirements that are included with CTS SR 3.2.4.2 when the NIS channel QPTR inputs are inoperable above 75% RTP. For the case when power is precisely equal to 75% RTP SR 3.2.4.1 is proposed to apply. With the changes to SRs 3.2.4.1 and 3.2.4.2 flux mapping requirements will not apply below 75% RTP when the NIS channel QPTR inputs are inoperable. The licensee stated that the existing layout of LCO 3.3.1, Condition D, could incorrectly lead an operator to believe that only the options of D.1.1 and D.1.2 could

apply, potentially overlooking the requirement to do a flux map for QPTR within 12 hours when power is > 75% RTP.

The NRC staff finds that replacing D.2.1 with D.1 and deleting Required Action D.2.2 are acceptable because the requirements that remain are equivalent to the STSs, do not result in any substantive changes in operating requirements, and are consistent with the Commission's regulations. These changes will provide for a consistent application of the TS actions and required tests.

Revision of Note 2 to Required Action D

Required Action D is revised by inserting a note directing operators to perform SR 3.2.4.2 upon discovery of an inoperable power range channel with power > 75% RTP.

The reference to SR 3.2.4.2 in the note replaces the need to specify performing SR 3.2.4.2 requirements in Required Action D.2.2 when the NIS input to QPTR is inoperable for power > 75% RTP. This is acceptable because D.2.2 restates the requirements of existing SR 3.2.4.2 to calculate QPTR every 12 hours as compensation for lost monitoring capability due to an inoperable NIS channel input to QPTR for thermal power > 75% RTP. This proposed change will help eliminate potential confusion regarding the completion time to perform SR 3.2.4.2.

The CTS requirement to perform a flux map at power levels precisely equal to 75% RTP would be eliminated as evaluated in Section 3.2.1 of this SE.

The NRC staff reviewed all of the administrative changes proposed by TVA to eliminate the potential confusion regarding duplicating the requirement to perform SR 3.2.4.2 and finds them acceptable because they are equivalent to the STSs, do not result in any substantive changes in operating requirements, and are consistent with the Commission's regulations. These changes will provide for a consistent application of the TS actions and required tests.

3.2.2 Proposed Changes to SRs 3.2.4.1 and 3.2.4.2

TVA explained the revision to SR 3.2.4.1 as the follows in the LAR:

Currently, there is a conflict between the requirements of WBN Units 1 and 2 TS 3.3.1, Condition D, and the requirements of WBN Units 1 and 2 SR 3.2.4.1, Note 1, and the Note in WBN Units 1 and 2 SR 3.2.4.2 regarding the required actions when thermal power is maintained exactly at 75% RTP. With an inoperable power range neutron flux channel and RTP equal to 75%, current WBN Units 1 and 2 TS 3.3.1, Required Action D.1.2 provides an alternative to performing SR 3.2.4.2 pursuant to WBN Units 1 and 2 TS 3.3.1, Required Action D.2.2. However, current WBN Units 1 and 2 SR 3.2.4.2 applies when a power range neutron flux channel is inoperable and thermal power is equal to 75% RTP. Therefore, the Note to WBN Units 1 and 2 SR 3.2.4.2 needs to be changed to > 75% RTP for consistency.

In the supplement dated February 8, 2018, TVA additionally explained:

TVA has determined that the changes to WBN Units 1 and 2 SR 3.2.4.1, Note 1, and the Note to WBN Units 1 and 2 SR 3.2.4.2 should not have been

characterized as an "administrative change." Therefore, TVA is providing additional information to further justify the change to WBN Units 1 and 2 SR 3.2.4.1, Note 1, and the Note to WBN Units 1 and 2 SR 3.2.4.2.

The change to Note 1 in WBN Units 1 and 2 SR 3.2.4.1 to change "< 75% RTP" to "≤ 75% RTP" is minor and inconsequential while restoring consistency with the required actions in TS 3.3.1, Condition D (both the current and proposed change), the existing SQN Units 1 and 2 SR 3.2.4.1, Note 1, and NUREG-1431, Revision 4.

In SR 3.2.4.1 the existing Note 1 is modified to revise the "<" sign to "≤." In SR 3.2.4.2 the existing note to SR 3.2.4.2 requires the SR to be performed when power range nuclear instruments are inoperable with THERMAL POWER ≥ 75% RTP. The note is changed by changing the sign from "≥" to ">." Performance SR 3.2.4.1 verifies QPTR by calculation and performance of SR 3.2.4.2 verifies QPTR by measurement.

These changes make the current SR 3.2.4.2 match the required action requirements originally located in TS LCO 3.3.1, Required Action D.1.2 and resolve the current inconsistency between the two requirements. The licensee explained that changing to a calculation of QPTR (via SR 3.2.4.1) when RTP is maintained at precisely 75% versus performing the currently required measurement (via SR 3.2.4.2), although a technical change, the change is minor and inconsequential. In either case QPTR can be determined and the requirements of LCO 3.2.4 would have to be met.

WBN, Unit 1, CTSs were developed from NUREG-1431, Revision 0, of September 28, 1992. WBN, Unit 2 CTSs were developed from the Unit 1 TS prior to initial licensing on October 22, 2015. In Revision 0 of the STS SR 3.2.4.1, Note 1, contained the "<" or less than sign and the note of SR 3.2.4.2 contained the "≥" or greater than or equal to sign. Revision 2 of the NUREG-1431, "Standard Technical Specifications" (April 30, 2001) SR 3.2.4.1, Note 1, contained the "≤" or less than or equal to sign and the note of SR 3.2.4.2 contained the "<" less than sign. Both versions of STSs were approved by the NRC staff. With the approval and issue of STSs, Revision 2, of April 30, 2001, the NRC staff had approved the change in signs between the SRs.

The NRC staff additionally reviewed the other modified portions of the notes as proposed by TVA for WBN and has determined that they are editorial in nature and finds the changes acceptable.

The NRC staff agrees with the licensee that difference in the change to calculating QPTR at precisely 75% RTP versus measuring, as required by CTS in SR 3.2.4.2 is minor and inconsequential and also the NRC staff has approved of this change in the past for STSs. These changes will help eliminate potential confusion and provide for a consistent application of the TS remedial actions and required tests. Therefore, the NRC staff has determined that the change is acceptable and that the resulting SRs 3.2.4.1 and 3.2.4.2 for WBN, Units 1 and 2, will comply with 10 CFR 50.36(c)(3).

3.3 Changes to the TS Bases Pages

The licensee included in its application the revised TS Bases pages to be implemented with the TS change. The NRC staff finds that the TS Bases Control Program is the appropriate process

for updating the affected TS Bases pages, and has, therefore, not included the revised Bases pages with these amendments.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Tennessee State official was notified of the proposed issuance of the amendments on July 27, 2018. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes SRs. 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 (82 *FR* 55416) November 21, 2017. 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.

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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principle Contributor: Peter J. Snyder

Date: August 30, 2018

SUBJECT: SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2; WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2 – ISSUANCE OF AMENDMENTS REGARDING REQUEST TO CHANGE TECHNICAL SPECIFICATION 3.3.1 AND SURVEILLANCE REQUIREMENT 3.2.4 (EPID L-2017-LLA-0287) DATED AUGUST 30, 2018

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