



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

March 10, 2021

Mr. John J. Grabnar
Energy Harbor Nuclear Corp.
Beaver Valley Power Station
Mail Stop P-BV-SSB
P.O. Box 4, Route 168
Shippingport, PA 15077-0004

SUBJECT: BEAVER VALLEY POWER STATION, UNITS 1 AND 2 – ISSUANCE OF
AMENDMENT NOS. 309 AND 199 RE: REVISE TECHNICAL
SPECIFICATIONS TO IMPLEMENT NEW SURVEILLANCE METHODS FOR
THE HEAT FLUX HOT CHANNEL FACTOR (EPID L-2020-LLA-0138)

Dear Mr. Grabnar:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment Nos. 309 and 199 to Renewed Facility Operating License Nos. DPR-66 and NPF-73 for the Beaver Valley Power Station, Units 1 and 2, respectively. These amendments consist of changes to the technical specifications in response to your application dated June 23, 2020.

The amendments revise the technical specifications to implement new surveillance methods for the heat flux hot channel factor (F_Q). Specifically, the amendments revise non-conservative Technical Specification 3.2.1, "Heat Flux Hot Channel Factor $F_Q(Z)$," to ensure that plant operation will remain bounded by the facility safety analyses. The list of NRC-approved analytical methods for the core operating limits in Technical Specification 5.6.3, "Core Operating Limits Report (COLR)," is also updated.

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

Sincerely,

/RA/

Jennifer C. Tobin, 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. 309 to DPR-66
2. Amendment No. 199 to NPF-73
3. Safety Evaluation

cc: Listserv



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

ENERGY HARBOR NUCLEAR CORP.
ENERGY HARBOR NUCLEAR GENERATION LLC
DOCKET NO. 50-334
BEAVER VALLEY POWER STATION, UNIT NO. 1
AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 309
Renewed License No. DPR-66

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Energy Harbor Nuclear Corp., acting on its own behalf and as agent for Energy Harbor Nuclear Generation LLC* (the licensee), dated June 23, 2020, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, 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.

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

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:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 309, 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 by December 15, 2021.

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: March 10, 2021



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

ENERGY HARBOR NUCLEAR CORP.
ENERGY HARBOR NUCLEAR GENERATION LLC
DOCKET NO. 50-412
BEAVER VALLEY POWER STATION, UNIT 2
AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 199
Renewed License No. NPF-73

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Energy Harbor Nuclear Corp., acting on its own behalf and as agent for Energy Harbor Nuclear Generation LLC* (the licensee), dated June 23, 2020, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, 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.

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

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-73 is hereby amended to read as follows:

- (2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 199, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto are hereby incorporated in the license. Energy Harbor Nuclear Corp. 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 by December 15, 2021.

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: March 10, 2021

ATTACHMENT TO LICENSE AMENDMENT NOS. 309 AND 199

BEAVER VALLEY POWER STATION, UNITS 1 AND 2

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

DOCKET NOS. 50-334 AND 50-412

Replace the following pages of the Renewed Facility Operating Licenses with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the area of change.

Renewed Facility Operating License No. DPR-66

Remove
Page 3

Insert
Page 3

Renewed Facility Operating License No. NPF-73

Remove
Page 4

Insert
Page 4

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.

Appendix A, Technical Specifications

Remove
3.2.1-1
3.2.1-2
3.2.1-3
3.2.1-4
5.6-3

Insert
3.2.1-1
3.2.1-2
3.2.1-3
3.2.1-4
5.6-3

- (3) Energy Harbor Nuclear Corp., 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) Energy Harbor Nuclear Corp., 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) Energy Harbor Nuclear Corp., 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
Energy Harbor Nuclear Corp. 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. 309, 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)

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

Energy Harbor Nuclear Corp. 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. 199, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto are hereby incorporated in the license. Energy Harbor Nuclear Corp. shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3.2 POWER DISTRIBUTION LIMITS

3.2.1 Heat Flux Hot Channel Factor F_Q(Z) (RAOC-T(Z) Methodology)

LCO 3.2.1 F_Q(Z), as approximated by F_Q^δ(Z) and F_Q^ω(Z), shall be within the limits specified in the COLR.

APPLICABILITY: MODE 1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>----- - NOTE - Required Action A.4 shall be completed whenever this Condition is entered prior to increasing THERMAL POWER above the limit of Required Action A.1. SR 3.2.1.2 is not required to be performed if this Condition is entered prior to THERMAL POWER exceeding 75% RTP after a refueling. -----</p> <p>A. F_Q(Z) not within limit.</p>	<p>A.1 Reduce THERMAL POWER ≥ 1% RTP for each 1% F_Q^δ(Z) exceeds limit.</p> <p><u>AND</u></p> <p>A.2 Reduce Power Range Neutron Flux - High trip setpoints ≥ 1% for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action A.1.</p> <p><u>AND</u></p> <p>A.3 Reduce Overpower ΔT trip setpoints ≥ 1% for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action A.1.</p> <p><u>AND</u></p> <p>A.4 Perform SR 3.2.1.1 and SR 3.2.1.2.</p>	<p>15 minutes after each F_Q^δ(Z) determination</p> <p>72 hours after each F_Q^δ(Z) determination</p> <p>72 hours after each F_Q^δ(Z) determination</p> <p>Prior to increasing THERMAL POWER above the limit of Required Action A.1</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>B. F_Q^W(Z) not within limits.</p>	<p>B.1.1 Implement a RAOC operating space specified in the COLR that restores F_Q^W(Z) to within its limits.</p> <p><u>AND</u></p>	<p>4 hours</p>
	<p>B.1.2 Perform SR 3.2.1.1 and SR 3.2.1.2 if control rod motion is required to comply with the new operating space.</p> <p><u>OR</u></p>	<p>72 hours</p>
	<p>B.2.1 -----NOTE----- Required Action B.2.4 shall be completed whenever Required Action B.2.1 is performed prior to increasing THERMAL POWER above the limit of Required Action B.2.1. -----</p> <p>Limit THERMAL POWER to less than RATED THERMAL POWER and reduce AFD limits as specified in the COLR.</p> <p><u>AND</u></p>	<p>4 hours</p>
	<p>B.2.2 Reduce Power Range Neutron Flux - High trip setpoints ≥ 1% for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action B.2.1.</p> <p><u>AND</u></p>	<p>72 hours</p>
	<p>B.2.3 Reduce Overpower ΔT trip setpoints ≥ 1% for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action B.2.1.</p> <p><u>AND</u></p> <p>B.2.4 Perform SR 3.2.1.1 and SR 3.2.1.2.</p>	<p>72 hours</p> <p>Prior to increasing THERMAL POWER above the limit of Required Action B.2.1</p>
<p>C. Required Action and associated Completion Time not met.</p>	<p>C.1 Be in MODE 2.</p>	<p>6 hours</p>

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.2.1.2	Verify F _Q (Z) is within limit.	<p>Once after each refueling within 24 hours after THERMAL POWER exceeds 75% RTP</p> <p><u>AND</u></p> <p>Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which F_Q(Z) was last verified</p> <p><u>AND</u></p> <p>In accordance with the Surveillance Frequency Control Program</p>

5.6 Reporting Requirements

5.6.3 CORE OPERATING LIMITS REPORT (COLR) (continued)

WCAP-16045-P-A, "Qualification of the Two-Dimensional Transport Code PARAGON,"

WCAP-16045-P-A, Addendum 1-A, "Qualification of the NEXUS Nuclear Data Methodology,"

WCAP-12610-P-A & CENPD-404-P-A, Addendum 1-A, "Optimized ZIRLO™,"

WCAP-17661-P-A, "Improved RAOC and CAOC F_Q Surveillance Technical Specifications."

As described in reference documents listed above, when an initial assumed power level of 102% of RATED THERMAL POWER is specified in a previously approved method, 100.6% of RATED THERMAL POWER may be used when input for reactor thermal power measurement of feedwater flow is by the leading edge flow meter (LEFM).

Caldon, Inc. Engineering Report-80P, "Improving Thermal Power Accuracy and Plant Safety While Increasing Operating Power Level Using the LEFM $\sqrt{\text{TM}}$ System"

Caldon, Inc. Engineering Report-160P, "Supplement to Topical Report ER-80P: Basis for a Power Uprate with the LEFM $\sqrt{\text{TM}}$ System"

- c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.
- d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

5.6.4 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)

- a. RCS pressure and temperature limits for heat up, cooldown, low temperature operation, criticality, and hydrostatic testing, Overpressure Protection System (OPPS) enable temperature, and PORV lift settings as well as heatup and cooldown rates shall be established and documented in the PTLR for the following:

LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," and

LCO 3.4.12, "Overpressure Protection System (OPPS)"

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



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 309 AND 199 TO

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

ENERGY HARBOR NUCLEAR CORP.

BEAVER VALLEY POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-334 AND 50-412

1.0 INTRODUCTION

By application dated June 23, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20176A431), Energy Harbor Nuclear Corp. (the licensee) submitted a license amendment request (LAR) to change the Beaver Valley Power Station, Units 1 and 2 (Beaver Valley) Technical Specifications (TSs) to implement new surveillance methods for the heat flux hot channel factor (F_Q). The new surveillance methods are applicable to plants using either relaxed axial offset control (RAOC) or constant axial offset control (CAOC) surveillance formulations that are documented in the U.S. Nuclear Regulatory Commission (NRC, the Commission)-approved licensing topical report (TR) WCAP-17661-A, Revision 1, "Improved RAOC and CAOC F_Q Surveillance Technical Specifications" (ADAMS Package Accession No. ML19225C138) (WCAP-17661-A).

Along with several improvements to the RAOC and CAOC surveillance methodologies, WCAP-17661-A addresses issues previously discussed in Westinghouse Nuclear Safety Advisory Letter (NSAL) 09-05, Revision 1, "Relaxed Axial Offset Control F_Q Technical Specification Actions," and NSAL 15-01, "Heat Flux Hot Channel Factor Technical Specification Surveillance." These NSALs noted that there are non-conservatisms in the methodology in Westinghouse Standard Technical Specification (STS) 3.2.1B, "Heat Flux Hot Channel Factor ($F_Q(Z)$) (RAOC-T(Z) Methodology)," for plants that have implemented the RAOC methodology. In accordance with the guidance in NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications that are Insufficient to Assure Plant Safety," dated December 29, 1998 (ADAMS Accession No. ML031110108), NSAL 09-05 and NSAL 15-01 contained recommended administrative actions that ensured a very conservative set of compensatory measures to address the non-conservatisms. These measures were implemented administratively at Beaver Valley.

The LAR would change TS 3.2.1, "Heat Flux Hot Channel Factor $F_Q(Z)$," to be consistent with those changes reviewed and approved by the NRC staff in Appendix A of WCAP-17661-A. As both Beaver Valley Units operate with the RAOC methodology, the licensee would address its compliance with the two limitations identified in Section 5 of the NRC staff's final safety evaluation (SE) included within WCAP-17661-A. The licensee would also update TS 5.6.3,

“Core Operating Limits Report (COLR),” to include WCAP-17661-A (proprietary) as a TR documenting an applicable NRC-approved methodology.

2.0 REGULATORY EVALUATION

The specification for the F_Q limits ensures that the values of the initial total peaking factor assumed in the accident and transient analyses remain valid. As noted in NUREG-1431, Revision 4.0, “Standard Technical Specifications: Westinghouse Plants” (ADAMS Accession Nos. ML12100A222 and ML12100A228), the F_Q limits assumed in the emergency core cooling system performance evaluation are typically limiting relative to the F_Q limits assumed in safety analyses for other postulated accidents and anticipated operational occurrences. Even if the emergency core cooling system limits are less limiting than those determined by another safety analysis, specification of and adherence to the F_Q limits still ensure that facility operation remains bounded by the safety analyses.

2.1 Performance Requirements and Design Criteria

The performance requirements and design criteria applicable to the power distribution assumed in the safety analysis are those that pertain to accident and transient analysis. Primarily, these include the requirements contained in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.46, “Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors,” and General Design Criterion (GDC) 10 contained in Appendix A, “General Design Criteria for Nuclear Power Plants,” to 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities.” Since the TSs also prescribe appropriate remedial action to follow if TS limitations are not met, some additional GDC relative to the reactor protection and reactivity control systems apply, as listed below.

The requirements in 10 CFR 50.46 state, in part, that the emergency core cooling system shall be designed such that an evaluation performed using an acceptable evaluation model demonstrates that acceptance criteria set forth in 10 CFR 50.46(b), including peak cladding temperature, maximum cladding oxidation, maximum hydrogen generation, maintenance of coolable core geometry, and long-term core cooling, are met for a variety of hypothetical loss-of-coolant accidents (LOCAs), including the most severe hypothetical LOCA.

GDC 10, “Reactor design,” states:

The reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

GDC 20, “Protection system functions,” states:

The protection system shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety.

GDC 26, "Reactivity control system redundancy and capability," states:

Two independent reactivity control systems of different design principles shall be provided. One of the systems shall use control rods, preferably including a positive means for inserting the rods, and shall be capable of reliably controlling reactivity changes to assure that under conditions of normal operation, including anticipated operational occurrences, and with appropriate margin for malfunctions such as stuck rods, specified acceptable fuel design limits are not exceeded. The second reactivity control system shall be capable of reliably controlling the rate of reactivity changes resulting from planned, normal power changes (including xenon burnout) to assure acceptable fuel design limits are not exceeded. One of the systems shall be capable of holding the reactor core subcritical under cold conditions.

The requirements for TSs are set forth in 10 CFR 50.36, "Technical specifications." Specific categories of TSs are provided in 10 CFR 50.36(c). These include limiting conditions for operation (LCOs) and surveillance requirements (SRs). If an LCO is not met, the facility must be shut down, or other acceptable remedial action must be taken. SRs are intended to ensure that LCOs will be met.

Paragraph (c)(2) of 10 CFR 50.36 discusses LCOs, stating that they are the lowest functional capability or performance levels of equipment required for safe operation of the facility. LCOs must be established for each item that meets one or more of four criteria. One of the criteria is a process variable, design feature, or operating restriction that is an initial condition of a design-basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Paragraph (c)(3) of 10 CFR 50.36 states:

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.

The guidance contained in Generic Letter (GL) 88-16, "Removal of Cycle-Specific Parameter Limits from Technical Specifications," dated October 4, 1988 (ADAMS Accession No. ML031200485), provides a means by which the values of certain parameters could be determined and modified on a cycle-specific basis without prior NRC review and approval. In order to implement this guidance, licensees should: (1) use an NRC-approved methodology to determine the operating limits; (2) include a list in the TS Administrative Controls section of the references used to determine the operating limits; and (3) maintain the limits in a COLR, which is submitted to the NRC for information.

2.2 Regulatory Requirements Application

The safety analyses required to establish that a facility will comply with the requirements of 10 CFR 50.46 and with GDC 10 require, as input, the peak fuel power and the power distribution. Since the peak fuel power and the power distribution are initial conditions of design-basis accident and transient analyses, facility operation must be controlled by LCOs that are established based on these parameters. Hence, Westinghouse pressurized-water reactors have LCOs relative to F_Q . In accordance with 10 CFR 50.36(c)(3), the LCO is accompanied by

SRs to ensure that the LCO will be met. At plants that have implemented GL 88-16, specific parameter values may be administratively controlled and, in such cases, these parameters must be determined in accordance with an NRC-approved methodology and contained in the facility COLR.

If, during the performance of an SR, the F_Q is determined not to be within the limit, then the LCO is not met and the TS remedial actions must be followed to ensure that facility operation remains safe. These remedial actions are based on (1) restoring compliance with the LCO and (2) adjusting the reactor protection system settings so that the functionality required by GDC 20 and GDC 26 is maintained.

3.0 TECHNICAL EVALUATION

The proposed changes to TS 3.2.1 would address the issues of non-conservatism described in Section 2.3 of the LAR by reformulating the transient F_Q surveillance and defining new required actions that ensure adequate margin recovery. An administrative change to the corresponding list of approved analytical methods for determining the core operating limits in TS 5.6.3.b would also be made to add WCAP-17661-A (proprietary).

The NRC staff evaluation of the modified TSs proposed by the licensee for Beaver Valley considered whether the modified TSs are consistent with the regulatory requirements identified in Section 2.0 above. Generically, the F_Q limits, surveillance methods, and remedial actions have been found to satisfy these requirements, as documented in the NRC final SE approving WCAP-17661 for licensing applications.

The NRC staff reviewed the proposed TSs in comparison to those contained in WCAP-17661-A and found that the TS changes are consistent with the TS 3.2.1 changes in Appendix A of WCAP-17661-A, which was reviewed and approved by the NRC staff. Section 4 of WCAP-17661-A provides the overall F_Q surveillance formulations. Sections 5 and 6 provide the associated TS requirements and an example application using the RAOC methodology, respectively. Also, Section 4 of the NRC final SE approving WCAP-17661 for licensing applications provides a detailed technical basis explaining why the new surveillance methodology and associated TS requirements are acceptable. The NRC staff's evaluation of the LAR addresses the acceptability of the proposed changes to TS 3.2.1 and TS 5.6.3.b and compliance with the limitations imposed on the use of the WCAP-17661-A methodology as discussed in Sections 3.1, 3.2, and 3.3, below, respectively.

3.1 Proposed Changes to TS 3.2.1

3.1.1 Administrative Changes to the Title and Header to Reflect the Different Methodology

The title for TS 3.2.1 would be changed from "Heat Flux Hot Channel Factor $F_Q(Z)$ " to "Heat Flux Hot Channel Factor $F_Q(Z)$ (RAOC-T(Z) Methodology)," and the header for this TS would be changed from " $F_Q(Z)$ " to " $F_Q(Z)$ (RAOC-T(Z) Methodology)."

The NRC staff finds that (1) the proposed changes to the name in the title and header correctly reflect the use of the methodology documented in the previously NRC-approved WCAP-17661-A, which is proposed to be adopted by Beaver Valley for licensing applications, and (2) the changes are consistent with the title and header of TS 3.2.1 in the previously NRC-approved Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the proposed changes are acceptable.

3.1.2 TS 3.2.1 Required Actions A.2 and A.3

Required Action A.2 would be changed from:

Reduce Power Range Neutron Flux – High trip setpoints $\geq 1\%$ for each $1\% F_Q^C(Z)$ exceeds limit.

to:

Reduce Power Range Neutron Flux – High trip setpoints $\geq 1\%$ for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action A.1.

Required Action A.3 would be changed from:

Reduce Overpower ΔT trip setpoints $\geq 1\%$ for each $1\% F_Q^C(Z)$ exceeds limit.

to:

Reduce Overpower ΔT trip setpoints $\geq 1\%$ for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action A.1.

The completion times of 72 hours associated with Required Actions A.2 and A.3 would remain unchanged.

During its generic review of WCAP-17661, the NRC staff approved the proposed revisions from “ 1% for each $1\% F_Q^C(Z)$ exceeds limit” to “ 1% for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action A.1.” The acceptable Required Actions A.2 and A.3 were incorporated as Required Actions A.2 and A.3 of TS 3.2.1B into Appendix A of the NRC-approved WCAP-17661-A. As discussed in Section 4.2 of the final SE approving WCAP-17661, the NRC staff indicated that the proposed changes are an improvement over the current required actions, since the current wording is only appropriate when the surveillance is performed at full-power, while the revised wording accounts for the possibility that the limits for $F_Q^C(Z)$ may be exceeded during a part-power surveillance. The proposed new wording would require a greater setpoint reduction if the surveillance is performed at part-power and $F_Q^C(Z)$ exceeds its limits.

During its plant-specific review of these changes for Beaver Valley, the NRC staff found that the proposed Required Actions A.2 and A.3 are consistent with the acceptable Required Actions A.2 and A.3 of TS 3.2.1B in Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the proposed changes, as part of the Beaver Valley adoption of the WCAP-17661-A methodology, are acceptable.

3.1.3 Note in TS 3.2.1 Condition A

As discussed in Section 4.2 of the NRC final SE approving WCAP-17661, the NRC previously approved the revised note in TS 3.2.1 Condition A. The current note states that “Required Action A.4 shall be completed whenever this Condition is entered.”

The revised note would state:

Required Action A.4 shall be completed whenever this Condition is entered prior to increasing THERMAL POWER above the limit of Required Action A.1. SR 3.2.1.2 is not required to be performed if this Condition is entered prior to THERMAL POWER exceeding 75% RTP [rated thermal power] after a refueling.

The acceptable revised note was incorporated as the note of TS 3.2.1 Condition A into Appendix A of the NRC-approved WCAP-17661-A. The revised note is acceptable because it would make the note consistent with the changes in required actions and SRs, and is an improvement over the current note.

During its plant-specific review of this change for Beaver Valley, the NRC staff found that the proposed note is consistent with the acceptable note for TS 3.2.1 Condition A in Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the proposed change, as part of the Beaver Valley adoption of the WCAP-17661-A methodology, is acceptable.

3.1.4 TS 3.2.1 Required Action B.1

The current Required Action B.1 states, "Reduce AFD [axial flux difference] limits $\geq 1\%$ for each $1\% F_Q^W(Z)$ exceeds limit." This required action would be deleted and replaced with new Required Actions B.1.1 and B.1.2, as follows:

B.1.1 Implement a RAOC operating space specified in the COLR that restores $F_Q^W(Z)$ to within its limits.

AND

B.1.2 Perform SR 3.2.1.1 and SR 3.2.1.2 if control rod motion is required to comply with the new operating space.

The completion time for proposed Required Action B.1.1 would be 4 hours.

The completion time for proposed Required Action B.1.2 would be 72 hours.

During its generic review of WCAP-17661, the NRC staff approved the proposed TS 3.2.1 Required Action B.1, which was incorporated as Required Actions B.1.1 and B.1.2 into Appendix A of WCAP-17661-A, as guidance for implementation of STSs. As discussed in Section 4.3.1 of the NRC final SE approving WCAP-17661, completion of Required Action B.1, as originally required, may have resulted in a need to move the control rods. The measured height-dependent radial peaking factor ($F_{xy}(Z)$) peak can occur adjacent to or in an assembly containing an inserted control rod, and the withdrawal of the control rod could potentially increase the resulting $F_Q^C(Z)$ and $F_Q^W(Z)$ measured values. Also, a revision to the allowed AFD band associated with implementing Required Action B.1.1 could result in either control rod withdrawal or insertion in order to obtain and maintain the AFD within the allowed operating band.

The NRC staff found that revised Required Action B.1 is acceptable because (1) with the revised Required Action B.1.1, the required implementation of a new RAOC operating space will restore $F_Q^W(Z)$ with limits and (2) the addition of Required Action B.1.2 to perform SR 3.2.1.1 and 3.2.1.2 will provide assurance that $F_Q^C(Z)$ and $F_Q^W(Z)$ remain within limits, or that

appropriate actions are taken for conditions when control rod motion is required to comply with the new operating space. RAOC operating space is a unique combination of AFD limits and control bank insertion limits. The operating spaces are reanalyzed using the approved methodology and included in the COLR.

During its plant-specific review of these changes for Beaver Valley, the NRC staff found that the added Required Actions B.1.1 and B.1.2, and the associated completion times are consistent with the acceptable Required Actions B.1.1 and B.1.2 in Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the proposed changes, as part of the Beaver Valley adoption of the WCAP-17661-A methodology, are acceptable.

3.1.5 New Logical Operator to Provide an Alternative TS 3.2.1 Required Action B.2 to Satisfy the Condition

The proposed Required Action B would consist of Required Action B.1.1, which requires the licensee to “Implement a RAOC operating space specified in the COLR that restores $F_Q^W(Z)$ to within its limits,” and Required Action B.1.2, in which implementation of a new operating space requires control rod motion. The proposed Required Action B would also contain Required Action B.2, which would include four actions (B.2.1, B.2.2, B.2.3, and B.2.4). The NRC staff finds that the added logical operator, “OR,” between Required Actions B.1 and B.2 is consistent with Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the proposed change, as part of the Beaver Valley adoption of the WCAP-17661-A methodology, is acceptable.

3.1.6 Required Action B.2 and Limitation on Thermal Power

Revised Required Action B.2 would include four actions (B.2.1, B.2.2, B.2.3, and B.2.4). These required actions involve reduction of the thermal power to less than the thermal power specified in the COLR, along with reduction of the reactor trip setpoints.

During its generic review of WCAP-17661, the NRC staff approved the proposed TS 3.2.1 Required Action B.2, which was incorporated as Required Action B.2 into Appendix A of WCAP-17661-A, as guidance for implementation of the STSs.

The NRC staff’s evaluation of the Beaver Valley adoption of the WCAP-17661-A methodology is provided in Sections 3.1.6.1 through 3.1.6.4, below, for Required Actions B.2.1 through B.2.4, respectively.

3.1.6.1 Required Action B.2.1

Required Action B.2.1 would be added as follows:

B.2.1 -----NOTE-----

Required Action B.2.4 shall be completed whenever Required Action B.2.1 is performed prior to increasing THERMAL POWER above the limit of Required Action B.2.1.

Limit THERMAL POWER to less than RATED THERMAL POWER and reduce AFD limits as specified in the COLR.

The completion time for Required Action B.2.1 would be 4 hours.

The NRC staff finds that the added Required Action B.2.1 and associated completion time are consistent with the corresponding Required Action B.2.1 in Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the added Required Action B.2.1, as part of the Beaver Valley adoption of the WCAP-17661-A methodology, is acceptable.

3.1.6.2 Required Action B.2.2

The current Required Action B.2 states, "Reduce Power Range Neutron Flux – High trip setpoints $\geq 1\%$ for each 1% that the maximum allowable power of the AFD limits is reduced." It would be revised to Required Action B.2.2 and would state, "Reduce Power Range Neutron Flux – High trip setpoints $\geq 1\%$ for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action B.2.1."

The NRC staff finds that the added Required Action B.2.2 is consistent with the corresponding Required Action B.2.2 in Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the added Required Action B.2.2, as part of the Beaver Valley adoption of the WCAP-17661-A methodology, is acceptable.

3.1.6.3 Required Action B.2.3

The current Required Action B.3 states, "Reduce Overpower ΔT trip setpoints $\geq 1\%$ for each 1% that the maximum allowable power of the AFD limits is reduced." It would be revised to Required Action B.2.3 and would state, "Reduce Overpower ΔT trip setpoints $\geq 1\%$ for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action B.2.1."

The NRC staff finds that the added Required Action B.2.3 is consistent with the corresponding Required Action B.2.3 in Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the added Required Action B.2.3, as part of the Beaver Valley adoption of the WCAP-17661-A methodology, is acceptable.

3.1.6.4 Required Action B.2.4

Required Action B.4 would become Required Action B.2.4 and its completion time would be changed from:

Prior to increasing THERMAL POWER above the maximum allowable power of the AFD limits

to:

Prior to increasing THERMAL POWER above the limit of Required Action B.2.1.

The NRC staff finds that the renumbered Required Action B.2.4 and its revised completion time are consistent with the corresponding Required Action B.2.4 in Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the changes, as part of the Beaver Valley adoption of the WCAP-17661-A methodology, are acceptable.

3.1.7 Note in TS 3.2.1 Condition B

The following note would be deleted.

-NOTE-
Required Action B.4 shall be completed whenever this Condition is entered.

During its generic review of WCAP-17661, the NRC staff approved the proposed deletion of the note in TS 3.2.1 Condition B, which was incorporated as TS 3.2.1 Condition B into Appendix A of WCAP-17661-A. The deletion of the note was acceptable because it was moved with the addition of the phrase, "prior to increasing THERMAL POWER above the limit of Required Action B.2.1" under newly added Required Action B.2.1 (i.e., applicable when required actions under B.2.1, B.2.2, B.2.3, and B.2.4 are entered).

During its plant-specific review of this change for Beaver Valley, the NRC staff found that the deletion of the note is consistent with the corresponding Condition B in Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the proposed deletion, as part of the Beaver Valley adoption of the WCAP-17661-A methodology, is acceptable.

3.1.8 Note Applicable to SRs 3.2.1.1 and 3.2.1.2

The following note would be deleted.

-NOTE-
During power escalation at the beginning of each cycle, THERMAL POWER may be increased until an equilibrium power level has been achieved, at which a power distribution map is obtained.

Section 4.4 of the NRC final SE approving WCAP-17661 indicates that the note applicable to SRs 3.2.1.1 and 3.2.1.2 was interpreted differently by different licensees. The proposed deletion of the note would remove this ambiguity. The existing frequencies in SRs 3.2.1.1 and 3.2.1.2 are unambiguous and appropriately verify $F_Q^C(Z)$ and $F_Q^W(Z)$ during the initial power escalation and throughout the operating cycle. During its generic review of WCAP-17661, the NRC staff approved the deletion of the note, which was incorporated into Appendix A of WCAP-17661-A.

During its plant-specific review of these changes for Beaver Valley, the NRC staff found that the proposed deletion of the note from SRs 3.2.1.1 and 3.2.1.2 is consistent with the acceptable SRs 3.2.1.1 and 3.2.1.2 in Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the deletion of the note, as part of the Beaver Valley adoption of the WCAP-17661-A methodology, is acceptable.

3.1.9 Second Frequency Requirement for SRs 3.2.1.1 and 3.2.1.2

The second frequency requirement for SR 3.2.1.1 would be changed from:

Once within 12 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified

to:

Once within 24 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified.

The second frequency requirement for SR 3.2.1.2 would be changed from:

Once within 12 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified

to:

Once within 24 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified.

As discussed in Section 4.5 of the NRC final SE approving WCAP-17661, the NRC staff approved the proposed increase in the time interval for completing the required surveillance from 12 hours to 24 hours, which was incorporated into Appendix A of WCAP-17661. The NRC's acceptance was based on its findings that some plant TSs have used a 24-hour time interval without any adverse effects, and there is a very small likelihood of the limiting design-basis event occurring during this period. Also, the NRC staff agreed that the risk of exceeding the F_Q limit during the 24-hour interval is acceptably small, given the constraints in SR 3.2.1 documented in WCAP-17661 that (1) $F_Q^C(Z)$ and $F_Q^W(Z)$ surveillances have been completed at a lower power level, (2) the next power level does not exceed the power level at which the $F_Q^C(Z)$ and $F_Q^W(Z)$ surveillances were completed by more than 10 percent, and (3) the surveillances are repeated within 24 hours of achieving the higher thermal power plateau.

During its plant-specific review of these changes for Beaver Valley, the NRC staff found that the proposed second frequency requirement of 24 hours in SRs 3.2.1.1 and 3.2.1.2 is consistent with the acceptable second frequency requirement for SRs 3.2.1.1 and 3.2.1.2 in Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the proposed second frequency requirement of 24 hours, as part of the Beaver Valley adoption of the WCAP-17661-A methodology, is acceptable.

3.1.10 Note to SR 3.2.1.2

The following note would be deleted:

-NOTE-
If measurements indicate that the maximum over z of [$F_Q^C(Z) / K(Z)$] has increased since the previous evaluation of $F_Q^C(Z)$:

- a. Increase $F_Q^W(Z)$ by the greater of a factor of 1.02 or by an appropriate factor specified in the COLR and reverify $F_Q^W(Z)$ is within limits or
- b. Repeat SR 3.2.1.2 once per 7 EFPD [effective full-power days] until either a. above is met or two successive flux maps indicate that the maximum over z of [$F_Q^C(Z) / K(Z)$] has not increased.

The intent of the note in the current TSs is to account for potential increases in $F_Q^W(Z)$ between surveillances. During its generic review of WCAP-17661, the NRC staff approved the proposed deletion, which was incorporated into Appendix A of WCAP-17661-A. As discussed in Section 4.6 of the NRC final SE approving WCAP-17661, the NRC staff indicated that the basis for its acceptance of the deletion of the note was that the required penalty factor is part of the $F_Q^W(Z)$ formulation in the new methodology. A penalty factor, R_j , is introduced and will be included in the COLR. The magnitude of the penalty factor is based on the predicted margin trends, and no additional assumptions or considerations are necessary.

During its plant-specific review of this change for Beaver Valley, the NRC staff found that the proposed deletion of the note from SR 3.2.1.2 is consistent with the acceptable SR 3.2.1.2 in Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the proposed deletion of the note, as part of the Beaver Valley adoption of the WCAP-17661-A methodology, is acceptable.

3.1.11 First Frequency Requirement for SR 3.2.1.2

The first frequency requirement for SR 3.2.1.2 would be changed from:

Once after each refueling prior to THERMAL POWER exceeding 75% RTP

to:

Once after each refueling within 24 hours after THERMAL POWER exceeds 75% RTP.

The intent of SR 3.2.1.2 is to ensure that F_Q will be maintained within the allowable operating limits during future non-equilibrium operation between the time of the current surveillance and the next required surveillance. Section 4.7 of the NRC final SE approving WCAP-17661 indicated that the surveillance factors needed to perform an accurate $F_Q^W(Z)$ margin assessment at a very low power are difficult to generate without advance knowledge of the expected operating power profile during power escalation. The revised first frequency requirement for SR 3.2.1.2 in WCAP-17661, assuring that the initial $F_Q^W(Z)$ surveillance is performed within 24 hours after the thermal power exceeding 75 percent RTP, would resolve

this concern. In addition, the ability to perform an accurate $F_Q^W(Z)$ margin assessment is substantially improved once steady-state operation above 75-percent RTP is achieved. During its generic review of WCAP-17661, the NRC staff approved the revised first frequency requirement for SR 3.2.1.2, which was incorporated into Appendix A of WCAP-17661-A.

During its plant-specific review of this change for Beaver Valley, the NRC staff found that the proposed first frequency requirement for SR 3.2.1.2 is consistent with the acceptable first frequency requirement for SR 3.2.1.2 in Appendix A of WCAP-17661-A. Therefore, the NRC staff concludes that the proposed first frequency requirement for SR 3.2.1.2, as part of the Beaver Valley adoption of the WCAP-17661-A methodology, is acceptable.

3.1.12 Acceptance of TS 3.2.1

Since the NRC staff found that the licensee proposed to implement the new RAOC surveillance methodology in a manner that is consistent with the NRC-approved WCAP-17661-A, the NRC staff determined that the proposed changes to TS 3.2.1 are acceptable.

3.2 Administrative Change to TS 5.6.3.b

The NRC staff-approved core operating limits analytical method would be added to the end of the list in TS 5.6.3.b, as follows:

WCAP-17661-P-A, "Improved RAOC and CAOC F_Q Surveillance Technical Specifications."

The NRC staff found that the proposed additional language does not list the associated revision number and date, which is different from the guidance in GL 88-06, "Removal of Organization Charts from Technical Specification Administrative Control Requirements," dated March 22, 1988 (ADAMS Accession No. ML031150335). GL 88-06 outlines a process that a licensee can use to move cycle-specific parameters from the plant-specific TSs to a licensee-controlled document entitled COLR. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC and documented in the TR(s). A necessary element of this process is that a licensee must include in the applicable TS-specific TR(s) with the TR number, title, and revision number and date, or the staff's SE report for a plant-specific methodology by NRC letter and date.

GL 88-06 was incorporated into the Improved Technical Specifications (ITS) with a slight modification by Technical Specifications Task Force (TSTF) Traveler TSTF-363, "Revise Topical Report References in ITS 5.6.5, COLR," dated March 3, 2000 (ADAMS Accession No. ML040630088), which allows licensees to omit TR revision numbers and dates from the TS list of COLR references. After the approval of TSTF-363 in 2000, the NRC staff had concerns that listing only the TR number and title in the TS will not require licensees to follow the conditions in the NRC SE that approved the TR (ADAMS Accession No. ML013340233). To resolve these concerns, the ITS was revised to eliminate the provisions of TSTF-363 that allowed licensees to list COLR references in the TS without revisions and dates. The IST revision and subsequent withdrawal of TSTF-363 are documented in TSTF-533-T (ADAMS Accession No. ML112590444).

Because of the large number of previous approvals for licensees to implement TSTF-363, the NRC staff also considered the requirements of 10 CFR 50.109, "Backfitting," and concluded that there is not a substantial increase in the overall protection of the public health and safety to be

derived from backfitting licensees that have already adopted TSTF-363. As a result, the NRC staff stated in its letter dated August 4, 2011 (ADAMS Accession No. ML110660285), that the NRC staff does not intend to backfit licensees whose TSs already reflect the flexibility afforded by TSTF-363. For subsequent licensing action reviews, the NRC staff took the position to allow a licensee that currently has approval to implement TSTF-363 to not include revision numbers and approval dates in the proposed citations for new NRC-approved TRs when the TRs are proposed for addition to the TS reference list.

Current Beaver Valley TS 5.6.3.b omits TR revision numbers and dates from the TS list of COLR references. Following this same TS change practice, the licensee has proposed to not include the revision number and date in the reference for WCAP-17661-A (proprietary). The NRC staff found that the approach of adding WCAP-17661-A (proprietary) without inclusion of the revision and date in TS 5.6.3.b is consistent with the current NRC review practices aligned with the statement in the NRC letter dated August 4, 2011. Therefore, the NRC staff concludes that proposed TS 5.6.3.b with the addition of NRC-approved WCAP-17661-A (proprietary) is acceptable.

3.3 Compliance with the Limitations Imposed on Use of WCAP-17661-A

Section 5 of the NRC final SE approving WCAP-17661 for licensing applications imposed two limitations. The licensee's compliance with the limitations is necessary to ensure acceptable implementation of WCAP-17661-A. The licensee's submittal adequately addresses these limitations as follows.

Relevant to the RAOC methodology, Limitation 1 on WCAP-17661-A (proprietary) specifies requirements on the use of the A_{xy} factor within the power distribution surveillance methodology. Specifically, Limitation 1 states that: (1) the NRC-approved methods provided in the response to Request for Additional Information (RAI) 15.b must be used to perform the surveillance-specific A_{xy} calculations and that newer methods with similar capabilities may be considered acceptable provided that the NRC staff specifically approves them for calculating A_{xy} factors and (2) the depletion calculation used to determine the numerator and denominator of the A_{xy} factor must be performed similarly to the original design calculation, as described the response to RAI 15.c. The licensee addressed Limitation 1 by stating in the LAR that it will calculate the A_{xy} factor using the methodologies described in WCAP-17661-A. In addition, the calculation approach described in WCAP-17661-A (i.e., response to RAI 15.c) will be used to determine the A_{xy} factor, and the proposed changes to TS 5.6.3 would list WCAP-17661-A as an approved methodology. The NRC staff reviewed the information provided by the licensee and determined that it adequately addresses this limitation.

Limitation 2 states that the final power level reduction following a failed F_Q surveillance must be to 50-percent RTP, which must be implemented on a plant-specific basis and included in the COLR input. The licensee addressed Limitation 2 by stating in the LAR that the COLR input for Beaver Valley, Units 1 and 2, fuel cycles will specify the level of less than 50-percent RTP as the final power level reduction in the event of a failed F_Q surveillance. The NRC staff reviewed the information provided by the licensee and determined that it adequately addresses this limitation.

Based on its review of the information provided by the licensee, the NRC staff determined that the licensee has acceptably addressed the two limitations included in the NRC staff final SE approving WCAP-17661 for licensing applications.

3.4 Technical Conclusion

Based on the review discussed in Sections 2 and 3 of this SE, the NRC staff determined that the proposed amendments are acceptable since WCAP-17661-A provides an acceptable way to determine operating limits and perform core surveillance in a way that demonstrates compliance with the regulatory requirements identified in Section 2.0 of this SE, and since the NRC staff determined that the licensee would acceptably implement WCAP-17661-A at Beaver Valley.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Commonwealth of Pennsylvania official was notified of the proposed issuance of the amendments on December 15, 2020. The official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 or change 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 as published in the *Federal Register* (85 FR 48571; August 11, 2020). 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.

Principal Contributor: S. Sun

Date: March 10, 2021

SUBJECT: BEAVER VALLEY POWER STATION, UNITS 1 AND 2 – ISSUANCE OF AMENDMENT NOS. 309 AND 199 RE: REVISE TECHNICAL SPECIFICATIONS TO IMPLEMENT NEW SURVEILLANCE METHODS FOR THE HEAT FLUX HOT CHANNEL FACTOR (EPID L-2020-LLA-0138) DATED MARCH 10, 2021

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DATE	12/21/2020	12/21/2020	1/6/2021	11/12/2020
OFFICE	OGC – NLO	NRR/DORL/LPL1/BC	NRR/DORL/LPL1/PM	
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