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

May 11, 2015

Mr. Mark E. Reddemann
Chief Executive Officer
Energy Northwest
P.O. Box 968 (Mail Drop 1023)
Richland, WA 99352-0968

SUBJECT: COLUMBIA GENERATING STATION - ISSUANCE OF AMENDMENT RE: TECHNICAL SPECIFICATION CHANGE TO SAFETY LIMIT MINIMUM CRITICAL POWER RATIO (TAC NO. MF5327)

Dear Mr. Reddemann:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 234 to Renewed Facility Operating License No. NPF-21 for the Columbia Generating Station (CGS). The amendment consists of changes to the Technical Specifications (TS) in response to your application dated November 17, 2014, as supplemented by letter dated March 17, 2015.

The amendment modifies TS 2.0, "Safety Limits," to revise values for the safety limit minimum critical power ratio (SLMCPR) for single and two recirculation loop operation due to core loading fuel management changes for the upcoming operating cycle. Specifically, the amendment increases the numeric values of SLMCPR in TS Section 2.1.1.2 to incorporate the results of the CGS Cycle 23 SLMCPR analysis.

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

Sincerely,

Balwant K. Singal, Senior Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosures:
1. Amendment No. 234 to NPF-21
2. Safety Evaluation

cc w/encls: Distribution via Listserv

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

ENERGY NORTHWEST

DOCKET NO. 50-397

COLUMBIA GENERATING STATION

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 234
License No. NPF-21

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

   A. The application for amendment by Energy Northwest (licensee), dated November 17, 2014, as supplemented by letter dated March 17, 2015, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;

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

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

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

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

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-21 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 234 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and shall be implemented before plant start-up from the spring 2015 refueling outage (Cycle 23).

FOR THE NUCLEAR REGULATORY COMMISSION

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

Attachment:
Changes to the Renewed Facility
Operating License No. NPF-21
and Technical Specifications

Date of Issuance: May 11, 2015

ATTACHMENT TO LICENSE AMENDMENT NO. 234

RENEWED FACILITY OPERATING LICENSE NO. NPF-21

DOCKET NO. 50-397

Replace the following pages of the Renewed Facility Operating License No. NPF-21 and Appendix A, Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Facility Operating License

REMOVE	INSERT
-4-	-4-

Technical Specification

REMOVE	INSERT
2.0-1	2.0-1

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 234 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

a. For Surveillance Requirements (SRs) not previously performed by existing SRs or other plant tests, the requirement will be considered met on the implementation date and the next required test will be at the interval specified in the Technical Specifications as revised in Amendment No. 149.

(3) Deleted.

(4) Deleted.

(5) Deleted.

(6) Deleted.

(7) Deleted.

(8) Deleted.

(9) Deleted.

(10) Deleted.

(11) Shield Wall Deferral (Section 12.3.2, SSER #4, License Amendment #7)

The licensee shall complete construction of the deferred shield walls and window as identified in Attachment 3, as amended by this license amendment.

(12) Deleted.

(13) Deleted.

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

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

2.1.1.1 With the reactor steam dome pressure < 785 psig or core flow < 10% rated core flow:

THERMAL POWER shall be ≤ 25% RTP.

2.1.1.2 With the reactor steam dome pressure ≥ 785 psig and core flow ≥ 10% rated core flow:

The MCPR shall be ≥ 1.10 for two recirculation loop operation or ≥ 1.13 for single recirculation loop operation.

2.1.1.3 Reactor vessel water level shall be greater than the top of active irradiated fuel.

2.1.2 Reactor Coolant System Pressure SL

Reactor steam dome pressure shall be ≤ 1325 psig.

2.2 SL Violations

With any SL violation, the following actions shall be completed within 2 hours:

2.2.1 Restore compliance with all SLs; and

2.2.2 Insert all insertable control rods.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 234 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-21

ENERGY NORTHWEST

COLUMBIA GENERATING STATION

DOCKET NO. 50-397

1.0 INTRODUCTION

By application dated November 17, 2014 (Reference 1), as supplemented by letter dated March 17, 2015 (Reference 2), Energy Northwest (the licensee) requested changes to the Technical Specifications (TSs) (Appendix A to Renewed Facility Operating License No. NPF-21) for the Columbia Generating Station (CGS). Portions of the letters dated November 17, 2014, and March 17, 2015, contain proprietary information and, accordingly, have been withheld from public disclosure.

The requested changes would modify TS 2.0, "Safety Limits," to revise values for the safety limit minimum critical power ratio (SLMCPR) for single and two recirculation loop operation due to core loading fuel management changes for the upcoming operating cycle. Specifically, the amendment would increase the numeric values of SLMCPR in TS Section 2.1.1.2 to incorporate the results of the CGS Cycle 23 SLMCPR analysis.

The supplemental letter dated March 17, 2015, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on February 3, 2015 (80 FR 5800).

2.0 REGULATORY EVALUATION

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include TSs as part of the license. The regulatory requirements related to the content of the TSs are contained in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36, "Technical specifications." The TS requirements in 10 CFR 50.36 include the following categories: (1) safety limits, limiting safety systems settings and control settings, (2) limiting conditions for operation, (3) surveillance requirements, (4) design features, and (5) administrative controls.

As stated in Section 1.2.1.3, "Plant Design Criteria," and further elaborated in Section 3.1, "Conformance with NRC General Design Criteria," of the CGS Final Safety Analysis Report (FSAR), the facility was designed to conform to 10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants." Therefore, the NRC staff reviewed the amendment to ensure compliance with the requirements of 10 CFR 50 Appendix A.

The regulations in 10 CFR 50, Appendix A, Criterion 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.

Fuel design limits can be exceeded if the fuel is producing heat equal to, or greater than, the critical power level. Normally, in a boiling-water reactor (BWR), heat being produced by the fuel causes nucleate boiling. When the power level of the fuel becomes high enough for the heat to cause a transition to film boiling, the fuel is considered to have reached critical power. Film boiling is much less efficient at transferring heat away from the fuel, so localized overheating of the fuel may occur. For BWRs, the critical power is predicted using a correlation known as the GE (General Electric) critical quality boiling length correlation, or better known as the GEXL correlation. Due to core and operational variations, the margin to boiling transition is most easily described in terms of a critical power ratio (CPR), which is defined as the rod critical power as calculated by GEXL divided by the actual rod power. More margin is gained as the CPR value exceeds 1.0.

The SLMCPR is calculated using a statistical process that takes into account operating parameters and uncertainties. The operating limit minimum critical power ratio (OLMCPR) is equal to the SLMCPR plus a CPR margin for transients. At the OLMCPR, at least 99.9 percent of the rods avoid boiling transition during steady state operation and transients caused by a single operator error or equipment malfunction. This acceptance criterion is consistent with Section 4.4, "Thermal and Hydraulic Design," of NUREG-0800, "Review of Safety Analysis Reports for Nuclear Power Plants" (Reference 3).

Safety limits are required to be included in the TS by 10 CFR 50.36. The SLMCPR is calculated on a cycle-specific basis because it is necessary to account for the neutronic and thermal-hydraulic response of each core design. If the cycle-specific SLMCPR is higher than the value indicated in the TS, the licensee must update the value in the TS.

3.0 TECHNICAL EVALUATION

3.1 Description of the Proposed Change

Current TS 2.0, Safety Limits," Section 2.1.1.2 states:

> With the reactor dome pressure ≥ 785 psig and core flow ≥ 10% rated core flow:
>
> The MCPR shall be ≥ 1.09 for two recirculation loop operation or ≥ 1.10 for single recirculation loop operation.

Revised TS 2.0, Safety Limits," Section 2.1.1.2 would state:

> With the reactor dome pressure ≥ 785 psig and core flow ≥ 10% rated core flow:
>
> The MCPR shall be ≥ 1.10 for two recirculation loop operation or ≥ 1.13 for single recirculation loop operation.

3.2 CGS Cycle 23 Core

CGS is a BWR/5 which has two recirculation loops. The licensee proposed to change the SLMCPR value in TS Section 2.1.1.2 from 1.09 to 1.10 for two recirculation loop operation, and from 1.10 to 1.13 for single recirculation loop operation. This requirement would be in effect when the reactor vessel steam dome pressure greater than or equal to 785 pounds per square inch gauge (psig) and the core flow greater than or equal to 10 percent of rated core flow.

The CGS Cycle 23 core loading will consist of 248 GNF2 fuel bundles and 516 GE14 fuel bundles in the core. Both fuel design types are manufactured by Global Nuclear Fuels-Americas, LLC (GNF). This cycle will be the first time that the GNF2 fuel design type will be used at CGS. The GE14 fuel is all burned fuel initially loaded in Cycles 20 through 22.

3.3 Methodology

The licensee developed the CGS Cycle 23 SLMCPR values using the following NRC-approved methodologies and uncertainties:

- NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel (GESTAR II)," December 2013 (including Supplement for United States) (Reference 4).
- NEDC-32505P-A, "R-Factor Calculation Method for GE11, GE12, and GE13 Fuel," July 1999 (Reference 5).
- NEDC-32601P-A, "Methodology and Uncertainties for Safety Limit MCPR Evaluations," August 1999 (Reference 6).
- NEDC-32694P-A, "Power Distribution Uncertainties for Safety Limit MCPR Evaluations," August 1999 (Reference 7).

Plant-specific use of these methodologies must adhere to certain restrictions.

3.3.1 Methodology Restrictions

Based on the review of Topical Reports (TRs) NEDC-32601P-A, NEDC-32694P-A, and Amendment 25 to NEDE-24011-P-A (GESTAR II) (Reference 8), the NRC staff identified the following restrictions for the use of these topical reports:

1. The TGBLA (lattice physics code) fuel rod power calculational uncertainty should be verified when applied to fuel designs not included in the benchmark comparisons of Table 3.1 of NEDC-32601P, since changes in fuel design can have a significant effect on calculation accuracy.

2. The effect of the correlation of rod power calculation uncertainties should be reevaluated to insure the accuracy of R-Factor uncertainty when the methodology is applied to a new fuel lattice.

3. In view of the importance of MIP (Minimum Critical Power Ratio (MCPR) Importance Parameter) criterion and its potential sensitivity to changes in fuel bundle designs, core loading and operating strategies, the MIP criterion should be reviewed periodically as part of the procedural review process to insure that the specific value recommended in NEDC-32601P is applicable to future designs and operating strategies.

4. The 3D-MONICORE bundle power calculational uncertainty should be verified when applied to fuel and core designs not included in the benchmark comparisons in Tables 3.1 and 3.2 of NEDC-32694P.

3.3.1.1 Restrictions (1), (2), and (4)

NEDE-24011-P-A provides a fuel design and core reload process that allows licensees to modify fuel assembly designs without undergoing a formal NRC submittal and review, as long as they provide written notification to the NRC outlining the new design and acknowledging compliance with the requirements of NEDE-24011-P-A. On March 14, 2007, GNF sent the NRC the aforementioned notification and generic compliance report for the GNF2 fuel assembly design (Reference 9). As part of an NRC audit related to this report, the analysis and evaluation of the GNF2 fuel design was verified to have been evaluated in accordance with the above restrictions (Reference 10). The NRC subsequently issued a finding that upon incorporation of Amendment 33, NEDE-24011-P (Reference 11) was acceptable for use with the GNF2 fuel design without any restriction.

Based on the above, the NRC staff concludes restrictions (1), (2), and (4) to the plant-specific application of the NEDE-24011-P-A methodology have been addressed for the GNF2 fuel design. Therefore, use of the NEDE-24011-P-A methodology by the licensee is acceptable.

3.3.1.2 Restriction (3)

The third restriction in the safety evaluation (SE) associated with the SLMCPR methodology is more general in that it applies not only to fuel bundle designs, but also core loading and operating strategies. The NRC staff evaluated two key changes for CGS Cycle 23 relative to past cycles.

The first change is that CGS received approval on January 31, 2014, to implement a Maximum Extended Load Line Limit Analysis (MELLLA), which allows for a significantly lower core flow rate during normal operation (Reference 12). Past analyses have shown that lower core flows may lead to a more limiting SLMCPR. The NRC staff confirmed that the minimum core flow SLMCPR calculation for CGS Cycle 23 was performed at 80.7 percent core flow and rated core power, which is consistent with the minimum core flow allowed using the MELLLA operating region for CGS. This condition was also found to be limiting as compared to the rated core flow and rated core power condition. The analysis indicates that, at low core flows, the limiting rod pattern and the nominal rod pattern are essentially the same. In this application, the licensee determined that the rod pattern used to calculate the SLMCPR at 100 percent rated power and 80.7 percent rated flow reasonably assures that at least 99.9 percent of fuel rods in the core would not be expected to experience boiling transition during normal operation or anticipated operational occurrences during the operation of CGS Cycle 23.

The second change is that there was a significant increase in the MIP. This parameter measures the core bundle-by-bundle MCPR distribution, and has been shown to be correlated with calculated SLMCPR values. The R-Factor Importance Parameter (RIP) also increased, but the increase was small in magnitude. By letter dated March 17, 2015 (Reference 2), the licensee explained that the change in MIP was due to a change in core loading design strategies. For CGS Cycle 23, the fresh bundles are being loaded in a radial distribution, where the highest enrichment bundles are located further away from the center. This results in a flatter radial power shape, which also produces a flatter MCPR distribution. In addition, the limiting rod pattern used in the analyses was an all-rods-out pattern, which further promotes a flat radial power distribution. The net effect is that more bundles are closer to the target OLMCPR, leading to a more limiting SLMCPR calculation (since there are more rods that may cross the boiling transition threshold). In its letter dated March 17, 2015, the licensee stated that the limiting rod pattern used would place more bundles closer to the target OLMCPR than nominal rod patterns, resulting in a bounding SLMCPR calculation. Therefore, the SLMCPR limiting rod pattern used for CGS Cycle 23 is appropriately bounding.

The NRC staff determined that the rod patterns used to calculate the SLMCPR at 80.7 percent of rated core flow and 100 percent of rated core power produce a limiting MCPR distribution that reasonably bounds the MCPR distributions that would be expected during the operation of the CGS core throughout Cycle 23. Therefore, the NRC staff concludes that the licensee's submittal demonstrates the validity of the criterion in restriction (3) (MIP criterion) for the operating conditions and loading pattern of CGS Cycle 23.

In summary, the NRC staff concludes that the licensee has adequately addressed the restrictions of TRs NEDC-32601P-A, NEDC-32694P-A, Amendment 25 to NEDE-24011-P-A (GESTAR II), and NEDC-32505P-A and that the use of these topical reports to evaluate the CGS Cycle 23 SLMCPR is acceptable.

3.4 Departures from NRC-Approved Methodology

No departures from NRC-approved methodologies were identified in the CGS Cycle 23 SLMCPR calculations.

3.5 Deviations from the NRC-Approved Calculational Uncertainties

3.5.1 R-Factor

The R-factor is an input into the GEXL correlation used to describe the local pin-by-pin power distribution and the fuel assembly and channel geometry on the fuel assembly critical power. The R-factor uncertainty analysis includes an allowance for power peaking modeling uncertainty, manufacturing uncertainty, and channel bow uncertainty. GNF has generically increased the GEXL R-Factor uncertainty to account for an increase in channel bow due to a previously unforeseen phenomenon called control blade shadow corrosion-induced channel bow, which is not accounted for in the channel bow uncertainty component of the approved R-Factor uncertainty (Reference 13). As a result, the licensee has increased this uncertainty for all SLMCPR calculations to account for the potential impact of control blade shadow corrosion induced bow. The CGS Cycle 23 analysis shows that the expected channel bow uncertainty for CGS is bounded by the increase in R-factor uncertainty as technically justified in Reference 13.

Thus, the NRC staff concludes that the use of the higher GEXL R-Factor uncertainty described in Reference 13 adequately accounts for the expected control blade shadow corrosion-induced channel bow for CGS Cycle 23.

3.5.2 Core Flow Rate and Random Effective Traverse In-core Probe Reading

GNF has agreed to the expansion of the state points used in the determination of the SLMCPR as described in GE Nuclear Energy letter dated August 24, 2004 (Reference 14). Consistent with Reference 14, the applicant performs analyses at the rated core power and minimum licensed core flow point in addition to analyses at the rated core power and rated core flow point. The NRC-approved SLMCPR methodology is applied at each state point.

The core flow and random traverse in-core probe (TIP) reading uncertainties used in single-loop operation minimum core flow SLMCPR analysis remain the same as in the rated core flow single-loop operation SLMCPR analysis because these uncertainties (which are substantially larger than used in two-loop operation analysis) already account for the effects of operating at reduced core flow.

For two-loop operation calculations performed at 80.7 percent core flow, the NRC-approved uncertainty values for the core flow rate (2.5 percent) and the random effective TIP reading (1.2 percent) are adjusted by dividing them by 0.807. The treatment of the core flow and random effective TIP reading uncertainties is based on the assumption that the signal-to-noise ratio deteriorates as core flow is reduced. The licensee stated that this increase is conservative based on the expectation that the variability in the absolute flow will decrease as flow decreases.

Since the increase in the uncertainty described above bounds the original non-flow dependent uncertainties, the NRC staff concludes that it is acceptable for CGS Cycle 23.

3.5.3 Fuel Axial Power Shape Penalty

GNF TR NEDC-32851P-A, "GEXL 14 Correlation for GE14 Fuel," dated April 2011 (Reference 15), on the SLMCPR correlations indicates that higher uncertainties and non-conservative biases in the GEXL correlations for different types of axial power shapes could potentially exist relative to the NRC-approved methodology. Therefore, the axial bundle power shapes for the limiting SLMCPR control rod patterns were obtained from the licensee's 3D core simulator PANACEA. The licensee determined that none of the limiting bundles had one of these types of axial power shapes. Therefore, no power shape penalties were applied to the calculated CGS Cycle 23 SLMCPR values. This approach is consistent with prior precedent for NRC approval of SLMCPR license amendment request submittals using the Reference 4 methodology.

The NRC staff determines that the licensee adequately considered the potential for a higher SLMCPR value resulting from non-conservatisms in the GEXL correlation due to certain axial power shapes within limiting bundles. Therefore, the use of no axial power shape penalties is acceptable.

3.5.4 Flow Area Uncertainty

During the review of the non-power distribution uncertainties from NEDC-32601P-A (References 6 and 8) that were applied to the SLMCPR, NRC staff noted that the value being used for the channel flow area uncertainty was derived based on GE12 fuel dimensions and tolerances. In its letter dated March 17, 2015 (Reference 2), the licensee utilized the Reference 6 methodology to calculate a new channel flow area uncertainty value for both GE14 and GNF2 fuels. The resulting values were both higher than the value used in the SLMCPR analysis. As a result, the licensee re-calculated the CGS SLMCPR values using the new values. The resulting impact to the SLMCPR was an increase of 0.001 in the two-loop and single-loop operation values. This increase did not impact the round-off of the SLMCPR, so the proposed change to the TS is still acceptable.

The licensee also provided a justification for continued use of the channel flow area uncertainty value based on GE12 described in letter dated March 17, 2015. The licensee justified its use based on various conservatisms inherent in the process. Since there was no change in the proposed change to the TS due to use of an updated value based on GE14 and GNF2 fuel, this justification was not necessary to make a determination on this license amendment request. Evaluation of a different approach for evaluating the channel flow area uncertainty than that documented in Reference 6 is outside the scope of this review.

The NRC staff concludes that while the channel flow area uncertainty value given in Reference 6 for GE12 fuel does not bound the GE14 and GNF2 fuel designs when utilizing the same calculational methodology, the non-conservative impact to the SLMCPR is insignificant to change the final result. Therefore, the proposed SLMCPR limits adequately address the uncertainties in channel flow areas for the GE14 and GNF2 fuel designs.

3.6 Core Monitoring System

For CGS Cycle 23, the GNF 3D MONICORE System TR NEDC-32694P-A (Reference 7) will be used as the core monitoring system. The 3D MONICORE system is in widespread use throughout the GNF fueled fleet of BWRs, including BWR/5 plants like CGS. Use of a current version of 3D MONICORE provides the plant capability to perform the reactivity anomaly surveillance. Use of 3D MONICORE has been previously evaluated and accepted by the NRC by letter dated March 11, 1999, as documented in Reference 8. Therefore, the NRC staff concludes that the use of the GNF 3D MONICORE system for CGS Cycle 23 is acceptable.

3.7 Results of NRC Staff Evaluation

The NRC staff concludes that the licensee's proposed Cycle 23 SLMCPR values of 1.10 for two recirculation loop operation and 1.13 for single recirculation loop operation are acceptable for CGS Cycle 23 because they were developed through the appropriate use of NRC-approved methodologies in accordance with NRC staff guidelines. The staff further concludes that the licensee used methods consistent with the regulatory requirements and guidance identified in Section 2.0 of this SE, including 10 CFR 50.36.

The licensee provided additional information in its letter dated March 17, 2015, that describes a different methodology for calculation of the channel flow area uncertainty than that described in the NRC-approved methodology in TR NEDC-32601P-A (Reference 6). This information was not necessary to make a safety determination on the proposed SLMCPR values, and was not evaluated. As a result, the NRC staff's determination is not based on the aforementioned alternative methodology.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding published in the *Federal Register* on February 3, 2015 (80 FR 5800). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

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

7.0 REFERENCES

1. Javorik, A. L, Energy Northwest, letter to U.S. Nuclear Regulatory Commission, "Columbia Generating Station, Docket No. 50-397 License Amendment Request for Technical Specification Change to Safety Limit Minimum Critical Power Ratio," dated November 17, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14336A100).

2. Javorik, A. L., Energy Northwest, letter to U.S. Nuclear Regulatory Commission, "Columbia Generating Station, Docket No. 50-397 Response to Request for Additional Information for License Amendment Request for Technical Specification Change to Safety Limit Minimum Critical Power Ratio," dated March 17, 2015 (ADAMS Accession No. ML15092A399).

3. U.S. Nuclear Regulatory Commission, NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 4.4, "Thermal and Hydraulic Design," Revision 2, March 2007 (ADAMS Accession No. ML070550060).

4. Global Nuclear Fuel – Americas LLC, Licensing Topical Report NEDE-24011-P-A, Revision 20, "General Electric Standard Application for Reactor Fuel (GESTAR-II)," including Supplement for United States, December 2013 (Proprietary information; not publicly available.). Non-proprietary version titled as NEDO-24011-A and Supplement for the United States available at ADAMS Accession Nos. ML13352A461 and ML13352A462, respectively.

5. General Electric (GE) Nuclear Energy Licensing Topical Report NEDO-32505P-A, Revision 1, "R-Factor Calculation Method for GE11, GE12, and GE13 Fuel," July 1999 (Proprietary information; not publicly available.). Non-proprietary version titled as NEDO-32505-A available at ADAMS Accession No. ML060520636.

6. GE Nuclear Energy Licensing Topical Report NEDC-32601P-A, Class III, "Methodology and Uncertainties for Safety Limit MCPR Evaluations," August 1999 (Proprietary information; not publicly available.).

7. GE Nuclear Energy Licensing Topical Report NEDC-32694P-A, Class III, "Power Distribution Uncertainties for Safety Limit MCPR Evaluations," August 1999 (Proprietary information; not publicly available.).

8. Akstulewicz, F., U.S. Nuclear Regulatory Commission, letter to Glen A. Watford, General Electric Company LLC, "Acceptance for Referencing of Licensing Topical Reports NEDC-32601P, Methodology and Uncertainties for Safety Limit MCPR Evaluations, NEDC-32694P, Power Distribution Uncertainties for Safety Limit MCPR Evaluation; and Amendment 25 to NEDE-24011-P-A on Cycle-Specific Safety Limit MCPR," dated March 11, 1999 (ADAMS Legacy Accession No. 993140059).

9. Lingenfelter, A., Global Nuclear Fuel-Americas LLC, letter to U.S. Nuclear Regulatory Commission, "GNF2 Advantage Generic Compliance with NEDE-24011-P-A (GESTAR II), NEDC-33270P, March 2007, and GEXL17 Correlation for GNF2 Fuel, NEDC-33292P, March 2007," dated March 14, 2007 (ADAMS Accession No. ML070780335).

10. Honcharik, Michelle C., memorandum to Stacey L. Rosenberg, U.S. Nuclear Regulatory Commission, "Audit Report for Global Nuclear Fuels GNF2 Advanced Fuel Assembly Design GESTAR II Compliance Audit," dated September 25, 2008 (ADAMS Accession No. ML082690382).

11. Blount, T. B., U.S. Nuclear Regulatory Commission, letter to Andrew A. Lingenfelter, Global Nuclear Fuel-Americas LLC, "Final Safety Evaluation for Amendment 33 to Global Nuclear Fuel Topical Report NEDE-24011-P, 'General Electric Standard Application for Reactor Fuel (GESTAR II),'" dated August 30, 2010 (ADAMS Accession No. ML102440481).

12. Lyon, C. F., U.S. Nuclear Regulatory Commission, letter to Mark E. Reddemann, Energy Northwest, "Columbia Generating Station – Issuance of Amendment RE: Implementation of Power Range Monitoring/Average Power Range Monitor/Rod Block Monitor/Technical Specifications/Maximum Extended Load Line Limit Analysis (PRNM/ARTS/MELLLA), (TAC ME7905), dated January 31, 2014 (ADAMS Accession No. ML13317B623)

13. Schardt, J. F., Global Nuclear Fuel-Americas LLC, letter to U.S. Nuclear Regulatory Commission, "Shadow Corrosion Effects on SLMCPR Channel Bow Uncertainty," dated November 10, 2004 (ADAMS Accession No. ML043480033).

14. Post, J. S., General Electric Company/GE Nuclear Energy, letter to U.S. Nuclear Regulatory Commission, "Part 21 Reportable Condition and 60-Day Interim Report; Notification: Non-Conservative SLMCPR," dated August 24, 2004 (ADAMS Accession No. ML042720293).

15. Global Nuclear Fuel-Americas LLC, Licensing Topical Report NEDC-32851P-A, Revision 5, "GEXL 14 Correlation for GE14 Fuel," April 2011 (Proprietary information; not publicly available.). Non-proprietary version titled as NEDO-32851-A available at ADAMS Accession No. ML111290532.

Principal Contributor: Scott T. Krepel, NRR/DSS/SRXB

Date: May 11, 2015

May 11, 2015

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P.O. Box 968 (Mail Drop 1023)
Richland, WA 99352-0968

SUBJECT: COLUMBIA GENERATING STATION - ISSUANCE OF AMENDMENT RE: TECHNICAL SPECIFICATION CHANGE TO SAFETY LIMIT MINIMUM CRITICAL POWER RATIO (TAC NO. MF5327)

Dear Mr. Reddemann:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 234 to Renewed Facility Operating License No. NPF-21 for the Columbia Generating Station (CGS). The amendment consists of changes to the Technical Specifications (TS) in response to your application dated November 17, 2014, as supplemented by letter dated March 17, 2015.

The amendment modifies TS 2.0, "Safety Limits," to revise values for the safety limit minimum critical power ratio (SLMCPR) for single and two recirculation loop operation due to core loading fuel management changes for the upcoming operating cycle. Specifically, the amendment increases the numeric values of SLMCPR in TS Section 2.1.1.2 to incorporate the results of the CGS Cycle 23 SLMCPR analysis.

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

Sincerely,

/RA/
Balwant K. Singal, Senior Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosures:
1. Amendment No. 234 to NPF-21
2. Safety Evaluation

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DATE	4/16/15	4/15/15	4/17/15	4/6/15
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NAME	JDean	AGhosh	MMarkley (LRenger for)	BSingal
DATE	4/27/15	5/5/15	5/11/15	5/11/15

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