



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

July 23, 2012

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

SUBJECT: COLUMBIA GENERATING STATION – REQUEST FOR ADDITIONAL  
INFORMATION REGARDING LICENSE AMENDMENT REQUEST TO  
IMPLEMENT PRNM/ARTS/MELLLA (TAC NO. ME7905)

Dear Mr. Reddemann:

By letter dated January 31, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML120400144), Energy Northwest (the licensee) submitted a license amendment request for Columbia Generating Station that would allow the licensee to expand the operating domain by the implementation of Average Power Range Monitor/Rod Block Monitor/Technical Specifications/Power Range Neutron Monitoring/Maximum Extended Load Line Limit Analysis (ARTS/PRNM/MELLLA). The Neutron Monitoring System would be modified by replacing the analog Average Power Range Monitor subsystem with the Nuclear Measurement Analysis and Control Power Range Neutron Monitoring System. The licensee would expand the operating domain to Maximum Extended Load Line Limit Analysis and make changes to certain allowable values and limits and to technical specifications. The changes to the technical specifications include the adoption of Technical Specifications Task Force (TSTF) Change Traveler TSTF-493, "Clarify Application of Setpoint Methodology for LSSS [Limiting Safety System Setting] Functions," Option A surveillance notes. Furthermore, the amendment would allow a change in the licensing basis to support Anticipated Transient without Scram accident mitigation with one Standby Liquid Control pump instead of two.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the information provided by the licensee and determined that additional information identified in the enclosure to this letter is needed in order for the NRC staff to complete its review. The draft copy of the request for additional information was provided in two parts to Mr. Zachary Dunham of your staff via e-mail on June 15 and July 10, 2012. A teleconference was held on July 19, 2012, with members of your staff. During the call, Mr. Dunham agreed to respond within 30 days of the date of this letter.

M. Reddeman

- 2 -

If you have any questions regarding this matter, I may be reached at (301) 415-1056 or via e-mail at [lauren.gibson@nrc.gov](mailto:lauren.gibson@nrc.gov).

Sincerely,

A handwritten signature in black ink that reads "Lauren Kate Gibson". The script is cursive and fluid, with the first name "Lauren" being the most prominent.

Lauren K. Gibson, Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosure:  
As stated

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST TO IMPLEMENT PRNM/ARTS/MELLLA

ENERGY NORTHWEST

COLUMBIA GENERATING STATION

DOCKET NO. 50-397

By letter dated January 31, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML120400144), Energy Northwest (the licensee) submitted a license amendment request for Columbia Generating Station (CGS) that would allow the licensee to expand the operating domain by the implementation of Average Power Range Monitor/Rod Block Monitor/Technical Specifications/Power Range Neutron Monitoring/Maximum Extended Load Line Limit Analysis (ARTS/PRNM/MELLLA). The Neutron Monitoring System would be modified by replacing the analog Average Power Range Monitor (APRM) subsystem with the Nuclear Measurement Analysis and Control (NUMAC) Power Range Neutron Monitoring System. The licensee would expand the operating domain to Maximum Extended Load Line Limit Analysis and make changes to certain allowable values and limits and to technical specifications. The changes to the technical specifications include the adoption of Technical Specifications Task Force (TSTF) Change Traveler TSTF-493, "Clarify Application of Setpoint Methodology for LSSS [Limiting Safety System Setting] Functions," Option A surveillance notes. Furthermore, the amendment would allow a change in the licensing basis to support Anticipated Transient without Scram (ATWS) accident mitigation with one Standby Liquid Control pump instead of two.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the submitted information and determined that the information below is needed for the staff to complete its evaluation.

1. On page 1-2 of NEDC-33507P, Revision 1, "Columbia Generating Station APRM/RBM/Technical Specifications / Maximum Extended Load Line Limit Analysis (ARTS/MELLLA)," January 2012 (nonproprietary version designated as NEDO-33507, Revision 1, available at ADAMS Accession No. ML12040A088), plants with either full or partial Average Power Range Monitor/Rod Block Monitor/Technical Specifications/Maximum Extended Load Line Limit Analysis (ARTS/MELLLA) were listed. The NRC staff requests the licensee to clarify the following:
  - a. Does CGS plan to implement full or partial ARTS/MELLLA?
  - b. Please provide the basis for your decision in part (a) and the main differences between the two options with respect to CGS plant operation.
2. Please provide the CGS core design for which the MELLLA analysis was performed and the following results of fuel-dependent portion of the analysis:
  - a. Please describe core design for the current Cycle 20 for which the MELLLA analysis was performed, including number of GE14 and ATRIUM-10 fuels

Enclosure

assumed to comprise the core, and their burnup history (i.e., number of cycles exposed in the core) for each fuel types.

- b. For a given core condition of a mixed core, the Specified Acceptable Fuel Design Limits (SAFDLs), such as minimum critical power ratio (MCPR), linear heat generation rate (LHGR), and peak cladding temperature (PCT), depend on the type of fuel design and their respective burnup history. Which fuel design (GE14 or ATRIUM-10) produces the limiting SAFDLs for the transient and accident analyses performed at the MELLLA conditions? Please explain why.
3. The fourth bullet from the bottom of page 7-2 of NEDC-33507P, Revision 1, states, "A full core of GE14 fuel is assumed to comprise the core."
  - a. Please clarify which of the transient and accident analyses (i.e., anticipated operational occurrences (AOOs), loss-of-coolant accident (LOCA), American Society of Mechanical Engineers (ASME) Overpressure and ATWS) assumed a full core of GE14 fuel.
  - b. Please explain why GE14 fuel was assumed to comprise the entire core when the core included ATRIUM-10 fuel, as well.
  - c. If a full core of GE14 fuel was assumed to comprise the core, please explain how the analysis captures a situation when ATRIUM-10 fuel is more limiting in the transient and accident analyses, and provide reasonable assurance as to how the analysis of record is most conservative.
4. In Table 7-1, "ECCS-LOCA Analysis Bases for CGS ARTS/MELLLA," of NEDC-33507P, Revision 1, the emergency core cooling system-LOCA rated thermal power was assumed to be equal to 3629 megaWatts (MWt), which is 4.1 percent (143 MWt) higher than the current licensed thermal power (CLTP) of 3486 MWt. The NRC staff understands that Appendix K to 10 CFR Part 50 requires analyses to be performed at 2 percent higher than the CLTP to allow for instrumentation error. Please explain why the LOCA analysis was performed at a thermal power which is 4.1 percent higher than the CLTP.
5. Please describe your training program for the operators in preparation for implementing the ARTS/MELLLA operation at CGS. If applicable, please describe any additional changes to training or qualifications.
6. In many of the sections describing human factors changes, the submittal states that changes were made in accordance with CGS Design Specification 204 for Human Factors. Please provide a description of this Design Specification and its relevance to Human Factors. Also, please identify any regulatory precedents where this Design Specification was approved previously.
7. Please describe what, if any, operator actions are being changed, added or deleted.

8. Please describe any new task analyses results that were completed to identify functional requirements and to provide inputs for function allocation.
9. Please describe any changes to physical interfaces.
10. Please describe changes that will be required to the procedures for the new digital upgrade. Please provide a list of those changes.
11. Please describe how CGS has applied insights from industry operating experience.

M. Reddeman

- 2 -

If you have any questions regarding this matter, I may be reached at (301) 415-1056 or via e-mail at [lauren.gibson@nrc.gov](mailto:lauren.gibson@nrc.gov).

Sincerely,

**/RA/**

Lauren K. Gibson, Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosure:

As stated

cc w/encl: Distribution via Listserv

**DISTRIBUTION:**

PUBLIC

LPLIV Reading

RidsAcrsAcnw\_MailCTR Resource

RidsNrrDorLpl4 Resource

RidsNrrPMColumbia Resource

RidsNrrLAJBurkhardt Resource

RidsOgcRp Resource

RidsRgn4MailCenter Resource

MRazzaque, NRR/DSS/SRXB

MKeefe, NRR/DRA/AHPB

**ADAMS Accession No. ML12201B050**

OFFICE	NRR/DORL/LPL4/PM	NRR/DORL/LPL4/LA	NRR/DRA/AHPB/BC
NAME	LKGibson	JBurkhardt	UShoop
DATE	7/23/12	7/23/12	7/23/12
OFFICE	NRR/DSS/SRXB/BC (A)	NRR/DORL/LPL4/BC	NRR/DORL/LPL4/PM
NAME	SMiranda	MMarkley	LKGibson
DATE	7/23/12	7/23/12	7/23/12

**OFFICIAL RECORD COPY**