



Bradley J. Sawatzke
Columbia Generating Station
P.O. Box 968, PE08
Richland, WA 99352-0968
Ph. 509.377.4300 | F. 509.377.4150
bjsawatzke@energy-northwest.com

Proprietary – Withhold under 10 CFR 2.390. Enclosures 1 and 3 contain PROPRIETARY information.

April 11, 2013
GO2-13-059

10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

**Subject: COLUMBIA GENERATING STATION, DOCKET NO. 50-397
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING LICENSE AMENDMENT REQUEST TO IMPLEMENT
PRNM/ARTS/MELLLA**

- References:**
- 1) Letter, GO2-12-017, dated January 31, 2012, BJ Sawatzke (Energy Northwest) to NRC, "License Amendment Request to Change Technical Specifications in Support of PRNM / ARTS / MELLLA Implementation" (ADAMS Accession No. ML12040A072)
 - 2) Letter dated September 5, 2012, NRC to ME Reddemann (Energy Northwest), "Columbia Generating Station – Request for Additional Information Regarding License Amendment Request to Implement PRNM/ARTS/MELLLA (TAC NO. ME7905)" (ADAMS Accession No. ML13067A106)

Dear Sir or Madam:

By Reference 1, Energy Northwest requested approval of a license amendment request to revise the Columbia Generating Station Technical Specifications to reflect improvements in the Average Power Range Monitor / Rod Block Monitor Technical Specifications (ARTS) and expand the facility operating domain to reflect operations using the Maximum Extended Load Line Limit Analysis (MELLLA). These improvements coincide with the installation of the digital General Electric-Hitachi (GEH) Nuclear Measurement Analysis and Control (NUMAC) Power Range Neutron Monitoring (PRNM) System.

Via Reference 2, the Nuclear Regulatory Commission (NRC) requested additional information related to the Energy Northwest submittal. Transmitted herewith in Enclosure 1 is the response to the request for additional information (RAI).

When Enclosures 1 and 3 are removed from this letter, the letter and remaining Enclosures are NON-PROPRIETARY.

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NRR

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE
AMENDMENT REQUEST TO IMPLEMENT PRNM/ARTS/MELLLA**

Page 2

The response to RAI 18 proposes an NRC review of the GEH setpoint calculation spreadsheets to be facilitated by GEH personnel. This review was conducted on April 3, 2013, at the NRC offices. Additional RAIs have resulted from this review. The response to these additional RAIs will be provided separately.

There are no new regulatory commitments identified with this response. Should you have any questions or require additional information regarding this matter, please contact Ms. LL Williams, Licensing Supervisor, at (509) 377-8148.

Enclosures 1 and 3 contain proprietary information as defined by 10 CFR 2.390. GEH, as the owner of the proprietary information, has executed the affidavit, included in Enclosure 4, which identifies that the enclosed proprietary information has been handled and classified as proprietary, is customarily held in confidence, and has been withheld from public disclosure. The proprietary information was provided to Energy Northwest in a GEH transmittal that is referenced by the affidavit. The proprietary information has been faithfully reproduced in the respective Attachment and Enclosures such that the affidavit remains applicable. GEH hereby requests that the enclosed proprietary information be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17. Information that is not considered proprietary is provided in Enclosure 2. Per NRC Information Notice 2009-07, in instances in which a nonproprietary version would be of no value to the public because of the extent of the proprietary information, the NRC does not expect a nonproprietary version to be submitted. In this case, Enclosure 3 is proprietary in its entirety; therefore no non-proprietary version is included.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the date of this letter.

Respectfully,



BJ Sawatzke

Vice President, Nuclear Generation & Chief Nuclear Officer

Enclosure 1 - Response to NRC EICB RAIs, Enclosure 1 of GEH Letter GE-MS-CT-106244-JC24, "ENW-CGS PRNM/ARTS/MELLLA Round 3 RAI Responses (Proprietary)

Enclosure 2 - Response to NRC EICB RAIs, Enclosure 2 of GEH Letter GE-MS-CT-106244-JC24, "ENW-CGS PRNM/ARTS/MELLLA Round 3 RAI Responses (Non Proprietary)

Enclosure 3 - Enclosure 3 of GE-MS-CT-106244-JC24, "Revised NEDC-33685P Appendix A References" (Proprietary)

Enclosure 4 – Affidavit for Enclosures 1 and 3

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE
AMENDMENT REQUEST TO IMPLEMENT PRNM/ARTS/MELLLA**

Page 3

cc: NRC Region IV Administrator
NRC NRR Project Manager
NRC Senior Resident Inspector/988C
AJ Rapacz – BPA/1399
WA Horin – Winston & Strawn
JO Luce – EFSEC
RR Cowley - WDOH

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE
AMENDMENT REQUEST TO IMPLEMENT PRNM/ARTS/MELLLA**

Enclosure 2

Response to NRC EICB RAIs

Enclosure 2 of GEH letter, GE-MS-CT-106244-JC24*

ENW-CGS PRNM/ARTS/MELLLA Round 3 RAI Responses

Non-Proprietary Version

* This Enclosure also includes a revision to the RAI 17 response that was the result of an additional Request for Additional Information from the NRC audit that was held on April 3, 2013. The revised information was provided as enclosure 1 to GEH letter, GE-MS-CT-106244-JC25, "GEH Response to ENW-CGS PRNM/ARTS/MELLLA RAI 17."

Enclosure 2

GE-MS-CT-106244-JC24

GEH Responses to NRC EICB RAIs

Non-Proprietary Information-Class I (Public)

Non-Proprietary Notice

This is a non-proprietary version of the Enclosure 1 of GE-MS-CT-106244-JC24 which has the proprietary information removed. Portions of the document that have been removed are indicated by an open and closed bracket as shown here [[]].

Further Clarification for NRC RAI 4

When requested for software design specification (SDS) for maximum load line limit analysis (MELLLA), Energy Northwest stated that there is no separate SDS for MELLLA and that Option III supports MELLLA operation, and is implemented within average power range monitor (APRM) functional and automatic signal processor (ASP) stability modules. It further stated that “the APRM functional SDS specification is 26A8428, and the Columbia Generating Station (CGS) associated datasheet is 26A8428TC. The ASP stability SDS is 26A7713.” The Energy Northwest response further stated that APRM SDS’s references 68 and 69 of NEDC-33685P were changed to 26A8428 and 26A8428TC, respectively, during the design phase.

Please provide these three documents (26A8428, 26A8428TC, and 26A7713). If any of these documents have been previously provided, please provide the date and the ADAMS accession number, if available.

GEH Response

Please find 26A8428, 26A8428TC, and 26A7713 included in Enclosure 3.

Further Clarification for NRC RAI 5

In response to RAI 5, Energy Northwest stated that even though the words [[

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The NRC staff disagrees with the interpretation, because the words [[]] and "shall not" are not equivalent statements. Please confirm that the RVs used were independent of the design process. If so, then reference 29, Section 7.1.3 should be revised in the next update to state that the RV shall not have any role in.....". This will eliminate any future confusion regarding the intended interpretation.

GEH Response

The RV's used in Columbia were independent of the design process. Common Procedure (CP) 03-09 Independent Design Verification (Reference 2) has been revised and no longer uses the words [[]]. CP 03-09 has also been restructured, eliminating Section 7.1.3. CP 03-09 Section 3.3 now provides the following requirement for the Responsible Verifier (RV):

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This eliminates any future confusion regarding the intended interpretation.

References

1. a. GE Hitachi Nuclear Energy, "Digital I&C-ISG-06 Compliance for Columbia Generating Station NUMAC Power Range Neutron Monitoring Retrofit Plus Option III Trip Function," NEDC-33685P, Revision 2, December 2012 (ADAMS Accession No. ML13015A272).
b. GE Hitachi Nuclear Energy, "Digital I&C-ISG-06 Compliance for Columbia Generating Station NUMAC Power Range Neutron Monitoring Retrofit Plus Option III Trip Function," NEDC-33685P, Revision 1, January 2012 (ADAMS Accession No. ML12040A074).
2. Common Procedure-Independent Design Verification, CP-03-09, Revision 7.

Further Clarification for NRC RAI 8

In response to RAI number 8, Energy Northwest addressed the various aspects of security controls from the conceptual phase to the design and development phase. The response did not specifically address the security measures taken during the test phase. Energy Northwest is requested to further describe how the different elements of the system were secured during the test phase.

Please describe the test location and the elements of the secure controls during various tests.

GEH Response

The GEH site in Wilmington, NC was the test location and the security controls described in the response to RAI 8 are applicable to the test phase.

Further Clarification for NRC RAI 17

RAI number 17 requested Energy Northwest to justify the use of the number 3 sigma where used. The licensee provided the following response:

For errors where there is a higher confidence that the error represents the maximum error, the Sigma number assigned by GEH for the setpoint calculation is three (3). For example, one instrument vendor, Rosemount, has stated that 100% of the instruments that they ship to their customers for use within a nuclear plant are tested prior to shipping to confirm that the instrument errors are within the error specifications for that instrument. Therefore, GEH has a higher confidence in those errors and assigns a three (3) Sigma number to them.

Energy Northwest has also provided an explanation for use of 3 sigma for as-left tolerances and leave alone tolerances based on the continuous use of tools and the assurance that the errors do not exceed the maximum allowed errors. This discussion also includes the justification for use of 3 sigma for APRM gain adjustment factor (AGAF).

The NRC staff agrees that when the instruments are always tested, or a maximum error or adjustment factor is used, a value of 3 sigma may be justifiable. However, the licensee has used the value of 3 sigma in the following documents without providing sufficient explanation or justification, unlike the cases specifically addressed above:

- *NEDC-33750P (ADAMS Accession No. ML12040A088),*
- *NEDC-33753P (ADAMS Accession No. ML12219A256), and*
- *NEDC-33754P (ADAMS Accession No. ML12219A258).*

Please review the above documents and provide appropriate justification for the use of 3 sigma.

Setpoint Audit Question 2

The following clarification was provided to RAI 17 (RAI regarding use of 3-Sigma errors), dated March 12, 2013: Not all of the 3-Sigma errors were explained in the information provided by the licensee; specifically, please explain the use of 3-Sigma for the rod block monitor tracking Process Measurement Accuracy (PMA) trip set points.

GEH Response

Calculation Documents:

Note that the further clarification for RAI-17 question listed NEDC-33750P, instead of NEDC-33507P (Reference 17-7), the latter being related to the instrument setpoint calculation documents.

Please note that NEDC-33754P (Reference 17-1) is essentially the same document as Attachment A to NEDC-33507P, Revision 1 (Reference 17-7). The same applies to the versions that do not contain GEH proprietary information (i.e., the NEDO documents, such as NEDO-33754).

Values and inputs for the errors for the CGS power range neutron monitor (PRNM) equipment are shown in the summary rod block monitor (RBM) Inputs/Outputs document (Reference 17-1) and in the summary average power range monitor (APRM) Inputs/Outputs document (Reference 17-2). These were used in the respective setpoint calculations. These summary Inputs/Outputs documents were transmitted for the NRC's review of the instrument uncertainty inputs used in the setpoint calculations.

GEH's Selection of Sigma Number Used in Setpoint Calculations:

For an instrument error used by GEH in a setpoint calculation, three (3) sigma number is assigned for two different situations, as discussed in the previous response to RAI 17 (Reference 17-8):

- **Case A:** A three (3) Sigma number is assigned to a specific error when there is a higher confidence that the error represents the maximum error.
- **Case B:** A three (3) Sigma number is assigned to the errors used for the calibration tools, calibration standards, and as-left tolerances (ALTs). The accuracies associated with calibration devices are considered to be 3 sigma numbers because the tools are used repeatedly and are continually tested against standards to ensure that the errors do not exceed the specified values. ALT and leave alone tolerance (LAT¹) values are considered to be 3 sigma because each represents the maximum deviation (error) permitted by procedure.

For each instance in the documents where a three (3) sigma number is identified, the justification will be described in Table 17-Supplemental-1 as meeting either Case A or Case B above.

As previously stated in the original response to RAI-17 (Reference 17-8), [[

]] Therefore, historically a value of 1% with a 3-sigma value has been used in GEH setpoint calculations. Additionally, the RBM PMA tracking error is a relatively small error compared to other errors (for example the neutron noise 2-sigma error is 2%, and this noise error is also part of the overall PMA error).

Note that the APRM gain adjustment factor (AGAF) of $\pm 2\%$ RTP is an ALT for the GEH NUMAC power electronics, and is used for the power-related setpoint functions:

- RBM power setpoint functions (e.g., RBM intermediate power setpoint (IPSP))
- APRM setpoint functions (e.g., APRM flow biased simulated thermal power – high scram)

¹ Note per the guidance provided in RIS 2006-17 (Reference 17-5) and TSTF-493 (Reference 17-6), the instrument setting must be set equal to the Limiting Trip Setpoint after periodic testing. In practice, the instrument setting is reset to the Final NTSP \pm ALT after each calibration. Thus, the LAT is set equal to the ALT in the GEH setpoint calculations.

Table 17-Supplemental-1

Setpoint Calculation Error Item	Location within NEDC-33507P (section/page)	Location within NEDC-33754P (RBM) (section/page)	Location within NEDC-33753P (APRM) (section/page)	Selection of 3 sigma based on Case A or B (section/page)
Process Measurement Accuracy (PMA) Tracking Error	Attachment A 1 / p A-5	1 / p 2	N/A	A
APRM Gain Adjustment Factor (AGAF) (used as an ALT and LAT)	Attachment A 2.1 / p A-12	2.1 / p 7	2.3 / p 15	B
Rosemount Flow Transmitter (FT) errors: Vendor Accuracy, Temperature Effect, Over-pressure Effect, Static Pressure Effect, Zero Shift	N/A	N/A	2.1 / pp 6 - 7	A
FT Calibration errors: ALT, LAT, Input Calibration Tools, Calibration Standards	N/A	N/A	2.1 / pp 8 - 9	B
GEH NUMAC Flow Electronics error: Input Calibration Tool	N/A	N/A	2.2 / p 12	B

References

(Note that the numbers used in this further clarification for RAI-17 response document are kept the same as the list in the original RAI-17 response (Reference 17-8). If a previous reference is not used, it is not listed below. Any new references start with number 17-7.)

- 17-1 GE Hitachi Nuclear Energy, “Columbia Generating Station, Instrument Limits Calculation, Rod Block Monitor (NUMAC ARTS-MELLLA),” NEDC-33754P, Revision 0, June 2012.
- 17-2 GE Hitachi Nuclear Energy, “Columbia Generating Station, Instrument Limits Calculation, Average Power Range Monitor (NUMAC ARTS-MELLLA),” NEDC-33753P, Revision 0, June 2012.
- 17-3 (not used in this response)
- 17-4 (not used in this response)
- 17-5 NRC Regulatory Issue Summary (RIS) 2006-17, “NRC Staff Position on the Requirements of 10 CFR 50.36, ‘Technical Specifications,’ regarding Limiting Safety System Settings during Periodic Testing and Calibration of Instrument Channels,” August 24, 2006 (ADAMS Accession No. ML051810077).
- 17-6 Letter, TSTF to NRC, “Transmittal of TSTF-493 Revision 4, Errata,” TSTF-10-07, dated April 23, 2010 (ADAMS Accession No. ML101160026).
- 17-7 GE Hitachi Nuclear Energy, “Energy Northwest, Columbia Generating Station, APRM/RBM/Technical Specifications / Maximum Extended Load Line Limit Analysis (ARTS/MELLLA),” NEDC-33507P, Revision 1, January 2012.
- 17-8 Energy Northwest, “Columbia Generating Station, Docket No. 50-397 Response to Request for Additional Information Regarding License Amendment Request to Implement PRNM/ARTS/MELLLA,” GO2-12-135, dated October 5, 2012 (ADAMS Accession No. ML122920735).

Further Clarification for NRC RAI 18

Please provide the referenced calculation as a proprietary document.

In addition, please note that attachments 3 and 4 to Energy Northwest letter of July 31, 2012, provided the calculations for instrument limit calculations for APRM flow-biased simulated thermal power scrams and rod blocks, and rod withdrawal blocks, respectively. These calculations include inputs and results of the calculations, but not the calculations that show how the setpoints are calculated per the approved methodology. Please provide the setpoint calculations.

GEH Response

Calculation spreadsheets:

Values and inputs for the errors for the CGS power range neutron monitor (PRNM) equipment are shown in the summary rod block monitor (RBM) Inputs/Outputs document (Reference 18-1) and in the summary average power range monitor (APRM) Inputs/Outputs document (Reference 18-2). These were used in the respective setpoint calculations. These summary Inputs/Outputs documents were previously transmitted for the NRC's review of the instrument uncertainty inputs used in the setpoint calculations.

However, due to the complexity of the Microsoft® Excel® spreadsheets, the summary Inputs/Outputs documents do not include the detailed calculations.

The associated setpoint calculation spreadsheets for References 18-1 and 18-2 may be viewed by the NRC at either their office or at a GEH office, at a mutually agreeable time. GEH will provide printouts and explanations, as needed, to facilitate the NRC review.

References

- 18-1 GE Hitachi Nuclear Energy, "Columbia Generating Station, Instrument Limits Calculation, Rod Block Monitor (NUMAC ARTS-MELLLA)," NEDC-33754P, Revision 0, June 2012.
- 18-2 GE Hitachi Nuclear Energy, "Columbia Generating Station, Instrument Limits Calculation, Average Power Range Monitor (NUMAC ARTS-MELLLA)," NEDC-33753P, Revision 0, June 2012.
- 18-3 Energy Northwest, "Columbia Generating Station, Docket No. 50-397 Response to Request for Additional Information Regarding License Amendment Request to Implement PRNM/ARTS/MELLLA," GO2-12-135, dated October 5, 2012 (ADAMS Accession No. ML122920735).

NRC RAI 19

The Columbia Power Range Neutron Monitoring System (PRNMS) reliability analysis was provided as NEDC-33751P, Revision 2, with the submittal of the Phase II information under Phase II package submitted July 31, 2012). The NRC staff has noted that failure rates for some of the hardware items (e.g., 386SX Computer Module, Display Controller Module, Fiber Direct Data Interface Communication Module, and the overall RBM Instrument MTBF) are higher than the failure rates noted in NEDC-32410-P, Supplement 1.

The explanation of the lower number being more conservative is based on the reliability number based on continuous operation at 40 degrees Celsius (°C). Per Note 3 to Table F-2 of NEDC-32410P-A, Supplement 1, the MIL handbook data is based on a continuous temperature of 40°C. Considering that the reliability numbers are based on 40°C, please clarify for the items identified in the paragraph above why the “temperature corrected reliability,” is as good as or better than the previous reliability numbers quoted in NEDC-32410P-A, Supplement 1.

GEH Response

As described in Section 1.2 of NEDC-33751P, Revision 2 (Reference 19-3), the reliability and unavailability analysis contained in Sections 2 and 3 of the Columbia PRNMS Reliability Analysis report provide a basis for concluding that sections 5.3.14 and 6.0 of the PRNM Licensing Topical Report (LTR) (Reference 19-1 as modified by Reference 19-2) remain valid for the Columbia Generating Station (CGS) Power Range Neutron Monitoring System (PRNMS). Specifically, NEDC-33751P, Revision 2 (Reference 19-3) contains an evaluation of the effect of the PRNMS modification on the reliability and availability of the APRM critical system functions and overall RPS failure frequency. The goal of the reliability analysis is to confirm that the predicted total unavailability of the PRNMS [[

]] is equivalent to, or better than, the current Power Range Monitor (PRM) system.

Table F.2 of the PRNM LTR (Reference 19-1 as modified by Reference 19-2) contains mean time between failure (MTBF) data for the PRNMS instruments, as well as the hardware modules included within each PRNMS instrument. Two types of MTBF values are listed in Table F.2 of the PRNM LTR (Reference 19-1 as modified by Reference 19-2):

- *Mil-217 MTBF hours* – MTBF values calculated using the methodology described in MIL-HDBK-217F and
- *Field MTBF hours* – MTBF values calculated based on the actual number of reported failures of the equipment over its operating history

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The MTBF data listed in Table F.2 of the PRNMS LTR was used in the 1990's to determine the overall unavailability of the APRM functions of the replacement PRNMS, which as stated in section 6.3.6 of the PRNM LTR (Reference 19-1 as modified by Reference 19-2), was determined to be less than [[]], the value calculated for the existing PRM system. For the Columbia PRNMS reliability analysis, the unavailability of the APRM functions of the replacement PRNM system was determined as described in section 6.3 of the PRNM LTR (Reference 19-1 as modified by Reference 19-2) and Section 3.1 of NEDC-33751P, Revision 2 (Reference 19-3) [[]] of NEDC-33751P, Revision 2. Based upon the updated MTBF data the predicted total unavailability of the APRM functions for the Columbia PRNMS is [[]], which is better than the unavailability of the existing PRM, which has a net total unavailability of [[]].

The *Mil-217* MTBF values listed in Table 2-2 of NEDC-33751P, Revision 2 (Reference 19-3) include changes, if any, in the design of the hardware that have occurred since preparation of the PRNMS LTR. The *Mil-217* MTBF values listed in Table F.2 of the PRNM LTR (Reference 19-1 as modified by Reference 19-2) and in Table 2-2 of NEDC-33751P, Revision 2 (Reference 19-3) were calculated based on continuous operation at 40°C.

For the PRNM Reliability Analysis described in the PRNM LTR (Reference 1 as modified by Reference 19-2), *field* MTBF values listed in Table F.2 of the PRNM LTR were determined based on the number of reported failures of the equipment that occurred over time. The *field* MTBF data contained in Table F.2 of the PRNM LTR was based on continuous operation of the hardware in the BWR Main Control Room, which is as stated in section 2.7 of NEDC-33751P, Revision 2 (Reference 19-3), at a normal operating range design center of approximately 23.9°C (75°F). It is noted that note 3 of Table F.2 of the PRNM LTR applies only to the column containing *Mil-217* MTBF values.

For the Columbia PRNMS reliability analysis, updated *field* MTBF values were determined that include hardware failures which occurred over an additional twenty years of operating history subsequent to preparation of the PRNM LTR (Reference 19-1 as modified by Reference 19-2). As described in section 2.7.3 of NEDC-33751P, Revision 2 (Reference 19-3), the *field* MTBF values listed in Table 2-2 of NEDC-33751P, Revision 2 are temperature corrected for continuous operation at 40°C. This temperature correction was performed using the methodology described in section 4.4.2.4.2 of the GE Environmental Qualification Program Licensing topical report, NEDE-24326-1-P (Reference 19-5), to ensure that the *field* MTBF and *Mil-217* MTBF values compared for selection of the MTBF value used as input to determine the predicted total unavailability of the APRM functions for the Columbia PRNMS were corrected for the same operating temperature (40°C).

Enclosure 2 to Non-Proprietary Information – Class I (Public)
GE-MS-CT-106244-JC24

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]] An additional margin of conservatism therefore exists in the *field* MTBF values listed in Table 2-2 of NEDC-33751P, Revision 2 that did not exist in the *field* MTBF values listed in Table F.2 of the PRNM LTR (Reference 19-19-1 as modified by Reference 19-19-2).

Table 19-1 contains a comparison of the *field* MTBF values for RBM hardware, for which the *field* MTBF values listed in Table 2-2 of NEDC-33751P, Revision 2 (Reference 19-19-3) were lower than those contained in Table F.2 of the PRNM LTR (Reference 19-19-1 as modified by Reference 19-19-2). As listed in Table 19-1, when adjusted to 23.9°C, the *field* MTBF values for RBM hardware from Table 2-2 of the Columbia Reliability Analysis are better than those listed in Table F.2 of the PRNM LTR. This comparison demonstrates the margin of conservatism that exists in the *field* MTBF values listed in Table 2-2 of the Columbia PRNMS Reliability Analysis that did not exist in the *field* MTBF values listed in Table F.2 of the PRNM LTR (Reference 19-19-1 as modified by Reference 19-19-2).

Table 19-1, Field MTBF Values for RBM Hardware

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Although differences between the MTBF values listed in Table 2-2 of the Columbia PRNMS Reliability Analysis and Table F.2 of the PRNM LTR (Reference 19-19-1 as modified by Reference 19-19-2) exist, the differences in the input values have no adverse impact on the outcome of the overall unavailability of the APRM critical system functions. This is due to the fact that the overall availability of the APRM critical system functions is determined [[

]] using the methodology described in Section 3.1 of NEDC-33751P Revision 2.

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References

- 19-1. GE Nuclear Energy, "Nuclear Measurement Analysis and Control Power Range Neutron Monitor (NUMAC PRNM) Retrofit Plus Option III Stability Trip Function," NEDC-32410P-A, October 1995.
- 19-2. GE Nuclear Energy, "Nuclear Measurement Analysis and Control Power Range Neutron Monitor (NUMAC PRNM) Retrofit Plus Option III Stability Trip Function," NEDC-32410P-A, Supplement 1, November 1997.
- 19-3. GE Hitachi Nuclear Energy, "Columbia Power Range Neutron Monitoring System (PRNMS) Reliability Analysis" NEDC-33751P, Revision 2, June 2012 (ADAMS Accession No. ML122190346).
- 19-4. Military Handbook, "Reliability Prediction of Electronic Equipment," MIL-HDBK-217F, December 1991.
- 19-5. General Electric Company, "General Electric Environmental Qualification Program," NEDE-24326-1-P, January 1983.

NRC RAI 20

In response to RAI 4, Energy Northwest stated that some of the references in NEDC-33685P document have changed (e.g., references 68 and 69 of NEDC-33685P) and have been replaced by new document numbers (e.g., software design specifications (SDS) 26A8428 and 26A8428TC). Please inform the NRC staff if any other documents provided in Appendix A, Software Development Process References, in NEDC-33865, Revision 1 have been revised. Please submit the revised documents.

GEH Response

The following documents referred to in Appendix A, Software Development Process References, NEDC-33685P (Reference 1) have been revised during the lifecycle of the Columbia PRNM project:

1. 23A5082 NUMAC Requirements Specification was Revision 1 and is currently Revision 2. This does not apply as the Columbia PRNM project was designed under Revision 1.
2. 24A5221 NUMAC PRNM Requirements Specification was Revision 17 and is currently Revision 18. This was a minor correction and will be submitted with this response.
3. 25A5916TC APRM Performance Specification Data Sheet was Revision 4 and is currently Revision 6. This was revised during Phase 2 testing and will be submitted with this response.

References

1. a. GE Hitachi Nuclear Energy, “Digital I&C-ISG-06 Compliance for Columbia Generating Station NUMAC Power Range Neutron Monitoring Retrofit Plus Option III Trip Function,” NEDC-33685P, Revision 2, December 2012 (ADAMS Accession No. ML13015A272).
b. GE Hitachi Nuclear Energy, “Digital I&C-ISG-06 Compliance for Columbia Generating Station NUMAC Power Range Neutron Monitoring Retrofit Plus Option III Trip Function,” NEDC-33685P, Revision 1, January 2012 (ADAMS Accession No. ML12040A074).

NRC RAI 21

Nuclear Measurement Analysis and Control (NUMAC) Requirements Specification, 23A5082, Rev. 1, was provided as part of Appendix A to NEDC-33685, Revision 1. Unfortunately, the document is unreadable. Please provide a more legible copy of the document.

GEH Response

A copy of 23A5082, Revision 1 is included in Enclosure 3.

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE
AMENDMENT REQUEST TO IMPLEMENT PRNM/ARTS/MELLLA**

Enclosure 4

Enclosure 4

Affidavits for Enclosures 1 and 3

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, **Linda C. Dolan**, state as follows:

- (1) I am the Manager of Regulatory Compliance, Regulatory Affairs, of GE-Hitachi Nuclear Energy Americas LLC ("GEH"), and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.
- (2) The information sought to be withheld is contained in Enclosures 1 and 3 of GEH letter, GE-MS-CT-106244-JC24, "ENW-CGS PRNM/ARTS/MELLLA Round 3 RAI Responses," dated April 2, 2013. The GEH proprietary information in Enclosure 1, which is entitled "GEH Responses to NRC EICB RAIs," is identified by a dotted underline inside double square brackets. [[This sentence is an example.^{3}]] In each case, the superscript notation ^{3} refers to Paragraph (3) of this affidavit, which provides the basis for the proprietary determination. Enclosure 3, which is entitled, "Revised NEDC-33685P Appendix A References," is proprietary in its entirety. The {3} included in the header of each page refers to paragraph (3) of this affidavit, which provides the basis for the proprietary determination.
- (3) In making this application for withholding of proprietary information of which it is the owner or licensee, GEH relies upon the exemption from disclosure set forth in the *Freedom of Information Act* ("FOIA"), 5 U.S.C. Sec. 552(b)(4), and the *Trade Secrets Act*, 18 U.S.C. Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), and 2.390(a)(4) for trade secrets (Exemption 4). The material for which exemption from disclosure is here sought also qualifies under the narrower definition of trade secret, within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975 F.2d 871 (D.C. Cir. 1992), and Public Citizen Health Research Group v. FDA, 704 F.2d 1280 (D.C. Cir. 1983).
- (4) The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs (4)a. and (4)b. Some examples of categories of information that fit into the definition of proprietary information are:
 - a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by GEH's competitors without license from GEH constitutes a competitive economic advantage over other companies;
 - b. Information that, if used by a competitor, would reduce their expenditure of resources or improve their competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;
 - c. Information that reveals aspects of past, present, or future GEH customer-funded development plans and programs, resulting in potential products to GEH;
 - d. Information that discloses trade secret or potentially patentable subject matter, or both, for which it may be desirable to obtain patent protection.

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- (5) To address 10 CFR 2.390(b)(4), the information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GEH, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GEH, not been disclosed publicly, and not been made available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions, or to proprietary or confidentiality agreements that provide for maintaining the information in confidence. The initial designation of this information as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in the following paragraphs (6) and (7).
- (6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, who is the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge, or who is the person most likely to be subject to the terms under which it was licensed to GEH. Access to such documents within GEH is limited to a "need to know" basis.
- (7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist, or other equivalent authority for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GEH are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary or confidentiality agreements, or both.
- (8) The information identified in paragraph (2), above, is classified as proprietary because it contains the detailed setpoint methodology and design information for the instrumentation and control equipment that is used in the design and analysis of the power range neutron monitoring system for the GEH Boiling Water Reactor (BWR). These methods, techniques, and data along with their application to the design, modification, and analyses associated with the power range neutron monitoring system was achieved at a significant cost to GEH.

The development of the evaluation processes along with the interpretation and application of the analytical results is derived from the extensive experience databases that constitute a major GEH asset. Moreover, procedure documentation is generally held as company proprietary throughout the General Electric Company. The procedure document discussed with reference to the verification process used by GEH is a part of the overall General Electric Company library of procedures that has been developed over the company's long history.

- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GEH's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GEH's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply

GE-Hitachi Nuclear Energy Americas LLC

the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GEH. The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial. GEH's competitive advantage will be lost if its competitors are able to use the results of the GEH experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GEH would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GEH of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing and obtaining these very valuable analytical tools.

I declare under penalty of perjury that the foregoing affidavit and the matters stated therein are true and correct to the best of my knowledge, information, and belief.

Executed on this 2nd of April 2013.



Linda C. Dolan
Manager, Regulatory Compliance
Regulatory Affairs
GE-Hitachi Nuclear Energy Americas LLC
3901 Castle Hayne Rd.
Wilmington, NC 28401

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, **Linda C. Dolan**, state as follows:

- (1) I am the Manager of Regulatory Compliance, Regulatory Affairs, of GE-Hitachi Nuclear Energy Americas LLC ("GEH"), and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.
- (2) The information sought to be withheld is contained in Enclosure 1 of GEH letter, GE-MS-CT-106244-JC25, "GEH Response to ENW-CGS PRNM/ARTS/MELLLA RAI 17," dated April 10, 2013. The GEH proprietary information in Enclosure 1, which is entitled "GEH Response to NRC EICB RAI 17" is identified by a dotted underline inside double square brackets. [[This sentence is an example.^{3}]] In each case, the superscript notation ^{3} refers to Paragraph (3) of this affidavit, which provides the basis for the proprietary determination.
- (3) In making this application for withholding of proprietary information of which it is the owner or licensee, GEH relies upon the exemption from disclosure set forth in the *Freedom of Information Act* ("FOIA"), 5 U.S.C. Sec. 552(b)(4), and the *Trade Secrets Act*, 18 U.S.C. Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), and 2.390(a)(4) for trade secrets (Exemption 4). The material for which exemption from disclosure is here sought also qualifies under the narrower definition of trade secret, within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975 F.2d 871 (D.C. Cir. 1992), and Public Citizen Health Research Group v. FDA, 704 F.2d 1280 (D.C. Cir. 1983).
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 - a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by GEH's competitors without license from GEH constitutes a competitive economic advantage over other companies;
 - b. Information that, if used by a competitor, would reduce their expenditure of resources or improve their competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;
 - c. Information that reveals aspects of past, present, or future GEH customer-funded development plans and programs, resulting in potential products to GEH;
 - d. Information that discloses trade secret or potentially patentable subject matter, or both, for which it may be desirable to obtain patent protection.
- (5) To address 10 CFR 2.390(b)(4), the information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GEH, and is in fact so held. The information sought to be withheld has, to the best of my

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knowledge and belief, consistently been held in confidence by GEH, not been disclosed publicly, and not been made available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions, or to proprietary or confidentiality agreements that provide for maintaining the information in confidence. The initial designation of this information as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in the following paragraphs (6) and (7).

- (6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, who is the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge, or who is the person most likely to be subject to the terms under which it was licensed to GEH. Access to such documents within GEH is limited to a "need to know" basis.
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- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GEH's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GEH's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

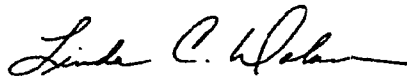
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I declare under penalty of perjury that the foregoing affidavit and the matters stated therein are true and correct to the best of my knowledge, information, and belief.

Executed on this 10th of April 2013.



Linda C. Dolan
Manager, Regulatory Compliance
Regulatory Affairs
GE-Hitachi Nuclear Energy Americas LLC
3901 Castle Hayne Rd.
Wilmington, NC 28401