



ENERGY NORTHWEST

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Proprietary – Withhold under 10 CFR 2.390. Attachment 2 and Attachment 4 contain PROPRIETARY information.

November 12, 2012
GO2-12-162

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, GO2-12-105, dated July 31, 2012, BJ Sawatzke (Energy Northwest) to NRC, "Submittal of Phase 2 Information in Support of License Amendment Request to Change Technical Specifications in Support of PRNM/ARTS/MELLLA Implementation" (ADAMS Accession No. ML12219A255)
 - 3) Letter, GO2-12-135, dated October 5, 2012, BJ Sawatzke (Energy Northwest) to NRC, "Response to Request for Information Regarding License Amendment Request to Implement PRNM/ARTS/MELLLA"
 - 4) Letter dated October 15, 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)"

Dear Sir or Madam:

By Reference 1, and as supplemented by Reference 2, 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 (APRM) / Rod Block Monitor (RBM) 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.

When Attachment 2 and Attachment 4 are removed from this letter, the letter and remaining Attachments are NON-PROPRIETARY.

ADD
NRR

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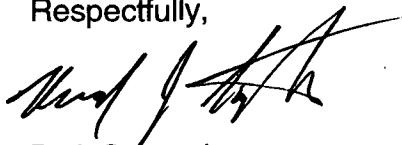
Via Reference 4, the Nuclear Regulatory Commission (NRC) requested additional information related to the Energy Northwest submittal. Transmitted herewith in Attachment 1 is the Energy Northwest response to the request for additional information (RAI).

In addition to the response to the RAI described above, this letter also contains revisions to two documents previously submitted. Specifically, in Reference 2, Attachment 2, GEH document NEDC-33751P had been identified as being entirely proprietary. Upon further review, GEH has identified portions of this document that do not contain proprietary information. Included with this letter as Attachment 2 is a revised proprietary version of this document with the only changes being the demarcations as to which information is considered to be proprietary information. Attachment 3 is the non-proprietary version (NEDO-33751). Additionally, in Reference 3, the GEH document included as Enclosure 1 had been identified as being entirely proprietary. Upon further review, GEH has identified portions of this document that do not contain proprietary information. Included with this letter as Attachment 4 is a revised proprietary version of this document with the only changes being the demarcations as to which information is considered to be proprietary information. The document has been provided with a GEH document number of NEDC-33789P. Attachment 5 is the non-proprietary version (NEDO-33789). The affidavits for the proprietary documents are included within the first few pages of the documents themselves.

There are no new regulatory commitments identified in this letter. Should you have any questions or require additional information regarding this matter, please contact Mr. Z. K. Dunham, Licensing Supervisor, at (509) 377-4735.

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

Respectfully,



B. J. Sawatzke
Vice President, Nuclear Generation & Chief Nuclear Officer

Attachment 1 - Response to Request for Additional Information

Attachment 2 - NEDC-33751P, Revision 3, "Columbia Generating Station Power Range Neutron Monitoring System Reliability Analysis," October 2012
(Proprietary)

Attachment 3 - NEDO-33751, Revision 3, "Columbia Generating Station Power Range Neutron Monitoring System Reliability Analysis," October 2012

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Attachment 4 – NEDC-33789, Revision 0, “NUMAC Power Range Neutron Monitoring (PRNM) Components 268X1331TCG001, 268X1332TCG001, G002 268X1333TCG001 Qualification Summary for Energy Northwest (ENW) Columbia Generating Station (CGS),” November 2012 (Proprietary)

Attachment 5 - NEDO-33789, Revision 0, “NUMAC Power Range Neutron Monitoring (PRNM) Components 268X1331TCG001, 268X1332TCG001, G002 268X1333TCG001 Qualification Summary for Energy Northwest (ENW) Columbia Generating Station (CGS),” November 2012

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

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Response to Request for Additional Information

NRC Request:

1. In the submittal, there is information related to verification and validation (V&V) of the software for this upgrade, but there does not appear to be information related to V&V of the operator actions. Please describe the on-site validation of the system, with the revised procedures, and trained operators.

Energy Northwest Response:

NUREG-0711, Revision 2, "Human Factors Engineering Program Review Model," identifies that Human Factors Verification and Validation evaluations are used to confirm that a final design conforms to Human Factors Engineering (HFE) design principles and that it enables personnel to successfully and safely perform their tasks to achieve operational goals. The three evaluation types spelled out in NUREG-0711 include:

- Human Systems Interface (HSI) Task Support Verification - an evaluation to verify that the HSI supports personnel task requirements as defined by task analyses.
- HFE Design Verification - an evaluation to verify that the HSI is designed to accommodate human capabilities and limitations as reflected in HFE guidelines such as those provided in NUREG-0700, "Human-System Interface Design Review Guidelines."
- Integrated System Validation - an evaluation using performance-based tests to determine whether an integrated system design (i.e., hardware, software, and personnel elements) meets performance requirements and acceptably supports safe operation of the plant.

HSI Task Support Verification - Discussion:

This verification ensures that the HSI provides all alarms, information, and control capabilities required for personnel tasks. The upgrade to the Power Range Neutron Monitor System (PRNMS) change does not impact reactor operating parameters or the functional requirements of the Average Power Range Monitoring (APRM) system. The replacement equipment continues to provide information, enforce control rod blocks, and initiate reactor scrams under appropriate specified conditions. As such, the operator actions remain unchanged when upgrading to the PRNMS, in that the same actions/responses occur with data received from the digital upgrade as with the analog APRM system that is being replaced. This is reflected in the response to the request for additional information (RAI) 7 of Reference 1-1, where Energy Northwest identified that no operator actions were being

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changed, added, or deleted as a result of the PRNMS upgrade. In the corresponding response to RAI 8 of Reference 1-1, Energy Northwest identified that with no significant changes to operator actions or functions, no new task analyses were performed. Hence, with no operator actions changing, or new task analyses performed, the need for a HSI Task Support Verification is obviated with the upgrade to the PRNMS.

HFE Design Verification – Discussion:

This verification ensures that the characteristics of the HSI and the environment in which it is used conform to HFE guidelines. Section 4.4.1.9, “Human Factors,” of the Nuclear Measurement and Control (NUMAC) Power Range Neutron Monitoring (PRNM) NRC approved Licensing Topical Report (LTR), Reference 1-2 identifies that:

The design of the PRNM replacement equipment meets the intent of NUREG-0700 as applicable to the back panel equipment. The base design for the plant operator’s panel uses the existing operator interface devices, so there is no effect on the plant human factor’s evaluations. The digital NUMAC Operator’s Display Assembly (ODA) alternate for the plant operator’s panel display has been designed to meet NUREG-0700 to the extent possible.

Energy Northwest is employing the alternate ODA option for the replacement PRNMS. The Human Factors Engineering (HFE) review included in the LTR (Reference 1-2) as well as the HFE review conducted by Energy Northwest for the Columbia Generating Station (CGS) ensured that the requirements of NUREG-0700 were met, and is summarized in the License Amendment Request (LAR), Reference 1-3, and LTR, Reference 1-2, respectively.

Integrated System Validation – Discussion:

Integrated system validation is the process by which an integrated system design (i.e., hardware, software, and personnel elements) is evaluated using performance-based tests to determine whether it acceptably supports safe operation of the plant. Section 4.4.1.10, “Training and Maintenance”, of the LTR (Reference 1-2) states:

The replacement PRNM equipment is designed to facilitate maintenance and minimize necessary operational training. The information presented is structured to be easily understood by a user familiar with the Neutron Monitoring System and its primary functions.

Energy Northwest confirmed the LTR’s diagnosis of minimal operator impact during the Factory Acceptance Test (FAT) conducted during October 2010 using the new CGS hardware attached to a plant simulator. During the FAT the following activities were conducted:

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- Classroom training for selected personnel from Operations, Maintenance and Engineering
- Hands-on training for selected personnel from Operations and Maintenance
- Verification and validation of Operations and Maintenance procedures

NUREG-0711, section 11.4.3.1, "Integrated System Validation Review Objective," states the following:

For the case of plant modifications, the applicability and scope of integrated system validation may vary. An integrated system validation should be reviewed for all modifications that may (1) change personnel tasks; (2) change tasks demands, such as changing task dynamics, complexity, or workload; or (3) interact with or affect HSIs and procedures in ways that may degrade performance. Integrated system validation may not be needed when a modification results in minor changes to personnel tasks such that they may reasonably be expected to have little or no overall effect on workload and the likelihood of error.

For the Energy Northwest upgrade to the PRNMS, an Integrated System Validation is not warranted as there is no change in required operator actions for the replacement hardware. Operator tasks remain unchanged; hence there is no impact to task dynamics, complexity or workload for the Operations staff. The HSI is designed such that the replacement PRNMS provides the same information as the legacy Neutron Monitoring System such that it is a reasonable expectation that there will be little or no overall effect on the operations staff with regards to workload or the likelihood of an error.

References

- 1-1 Letter, GO2-12-116, dated August 22, 2012, BJ Sawatzke (Energy Northwest) to NRC, "Response to Request for Additional Information Regarding License Amendment Request to Implement PRNM/ARTS/MELLLA" (ADAMS Accession No. ML12248A136)
- 1-2 (a) GE Nuclear Energy, "Nuclear Measurement Analysis and Control Power Range Neutron Monitor (NUMAC PRNM) Retrofit Plus Option III Stability Trip Function," NEDC-32410P-A Volume 1, October 1995.
- (b) GE Nuclear Energy, "Nuclear Measurement Analysis and Control Power Range Neutron Monitor (NUMAC PRNM) Retrofit Plus Option III Stability Trip Function," NEDC-32410P-A Volume 2 -- Appendices, October 1995.
- (c) 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.

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- 1-3 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)

NRC Request:

2. Please describe the long-term human performance monitoring program, if any, and how this modification affects it.

Energy Northwest Response:

NUREG-0711, Revision 2, identifies that, "A human performance monitoring strategy will help to provide reasonable assurance that the confidence developed by the completion of the integrated system validation is maintained over time."

As identified in the response to RAI 1 above, with no changes being made to any operator actions with the installation of this replacement system, no Integrated System Validation was warranted. Since the system provides automatic functions (e.g., input to Reactor Protection System scram signals, input to the Reactor Manual Control System control rod withdrawal blocks), the same as the existing analog NMS systems, there are no changes in required operator actions. Therefore, there is no need to monitor the human actions for degradation in performance, and, hence, there is no need for a human performance monitoring program for this planned system upgrade.

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, **Edward D. Schrull, PE**, state as follows:

- (1) I am the Vice President, Regulatory Affairs, Services Licensing, 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 GEH proprietary report, NEDC-33751P, “Columbia Generating Station Power Range Neutron Monitoring System Reliability Analysis,” Revision 3, dated October 2012. The GEH proprietary information in NEDC-33751P is identified by a dotted underline inside double square brackets. [[This sentence is an example.^{3}]] Large tables and figures containing GEH proprietary information are identified with double square brackets before and after the object. In each case, the 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 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC 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 F2d 871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704 F2d 1280 (DC 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 and/or potentially patentable subject matter 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,

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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 proprietary and/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 and/or confidentiality agreements.
- (8) The information identified in paragraph (2), above, is classified as proprietary because it contains detailed GEH design information of the instrumentation and control equipment used in the design and analysis of the power range neutron monitoring system for GEH Boiling Water Reactors (BWRs). Development of these methods, techniques, and information and their application for the design, modification, and analyses methodologies and processes 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 major GEH asset.

- (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.

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

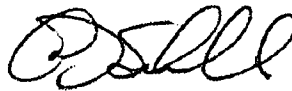
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quantify, but it clearly is substantial. GEH's competitive advantage will be lost if its competitors are able to use the results of the GEH experience to normalize or verify their own process or if they are able to claim an equivalent understanding 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 22nd day of October 2012.



Edward D. Schrull, PE
Vice President, Regulatory Affairs
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