Charles R. Pierce
Regulatory Affairs Director

Southern Nuclear Operating Company, Inc.
40 Inverness Center Parkway
Post Office Box 1295
Birmingham, Alabama 35201

Tel 205.992.7872
Fax 205.992.7601

Proprietary Information
Withhold Under 10 CFR 2.390

SOUTHERN COMPANY

May 6, 2013

Docket Nos.: 50-348
50-364

NL-13-0948

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

Joseph M. Farley Nuclear Plant
Response to Request for Additional Information Concerning the Deferral of Inservice Inspection of Reactor Pressure Vessel Cold Leg Nozzle Dissimilar Metal Weld – Questions 1, 3, and 5

Ladies and Gentlemen:

By letter dated October 1, 2012, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12276A110), Southern Nuclear Operating Company (SNC), submitted for the U.S. Nuclear Regulatory Commission (NRC) approval, the request for alternative (RFA) FNP-ISI-ALT-13, Version 1. SNC proposed an alternative to certain requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI. RFA FNP-ISI-ALT-13 relates to the inservice inspection requirements for the reactor pressure vessel (RPV) cold leg dissimilar metal welds at the Joseph M. Farley Nuclear Plant (FNP), Units 1 and 2, for the fourth 10-year interval, which commenced on December 1, 2007, and will end on November 30, 2017.

By letter dated April 11, 2013 (ADAMS Accession No. ML13036A261), the NRC issued a Request for Additional Information (RAI) containing six questions. Based on subsequent discussions with the NRC, SNC is submitting the response to RAI Questions 1, 3, and 5 in Enclosures 2 and 3. This will allow the NRC to begin review of the SNC RAI responses. The responses to Questions 2, 4, and 6 will be provided by the agreed upon due date.

Enclosure 1 contains the Westinghouse Electric Company (Westinghouse) Affidavit and the authorization to apply for its withholding. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR 2.390 of the Commission's regulations. Accordingly, it is respectfully requested that the information, which is proprietary to Westinghouse, be withheld from public disclosure in accordance with 10 CFR 2.390 of the Commission's regulations. Enclosure 2 contains information proprietary to Westinghouse, which is supported by the affidavit. Enclosure 3 contains the nonproprietary version of Enclosure 2.

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NRR

This letter contains no NRC commitments. If you have any questions, please contact Ken McElroy at (205) 992-7369.

Sincerely,

C. R. Pierce

C. R. Pierce
Regulatory Affairs Director

CRP/RMJ/lac

Enclosures:
1. Westinghouse Electric Company Affidavit
2. SNC Response to Request for Additional Information – Questions 1, 3, and 5 (Proprietary)
3. SNC Response to Request for Additional Information – Questions 1, 3, and 5 (Non-Proprietary)

cc: Southern Nuclear Operating Company
Mr. S. E. Kuczynski, Chairman, President & CEO
Mr. D. G. Bost, Executive Vice President & Chief Nuclear Officer
Mr. T. A. Lynch, Vice President – Farley
Mr. B. L. Ivey, Vice President – Regulatory Affairs
Mr. B. J. Adams, Vice President – Fleet Operations
RTYPE: CFA04.054

U. S. Nuclear Regulatory Commission
Mr. V. M. McCree, Regional Administrator
Ms. E. A. Brown, NRR Project Manager – Farley
Mr. P. K. Niebaum, Senior Resident –Farley
Mr. J. R. Sowa, Senior Resident – Farley

Joseph M. Farley Nuclear Plant
Response to Request for Additional Information Concerning the Deferral of Inservice Inspection of Reactor Pressure Vessel Cold Leg Nozzle Dissimilar Metal Weld – Questions 1, 3, and 5

Enclosure 1

Westinghouse Electric Company Affidavit

Westinghouse Electric Company
Nuclear Services
1000 Westinghouse Drive
Cranberry Township, Pennsylvania 16066
USA

U.S. Nuclear Regulatory Commission
Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Direct tel: (412) 374-4643
Direct fax: (724) 720-0754
e-mail: greshaja@westinghouse.com
Proj letter:

CAW-13-3706

May 1, 2013

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: Southern Nuclear Operating Company Letter NL-13-0948, Enclosure 2 "SNC Response to Request for Additional Information – Questions 1, 3, and 5 (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-13-3706 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying affidavit by Southern Nuclear Operating Company (SNC).

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference CAW-13-3706, and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, Suite 428, 1000 Westinghouse Drive, Cranberry Township, Pennsylvania 16066.

Very truly yours,

James A. Gresham, Manager
Regulatory Compliance

Enclosures

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

Before me, the undersigned authority, personally appeared James A. Gresham, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

James A. Gresham, Manager
Regulatory Compliance

Sworn to and subscribed before me
this 1st day of May 2013

Notary Public

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Anne M. Stegman, Notary Public
Unity Twp., Westmoreland County
My Commission Expires Aug. 7, 2016
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

(1) I am Manager, Regulatory Compliance, in Nuclear Services, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse Application for Withholding Proprietary Information from Public Disclosure accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of

Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, it is to be received in confidence by the Commission.

(iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in Enclosure 2 "SNC Response to Request for Additional Information – Questions 1, 3, and 5" (Proprietary), for submittal to the Commission, being transmitted by Southern Nuclear Operating Company (SNC) letter NL-13-0948 and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as prepared by Westinghouse is that associated with providing information requested by the NRC for their confirmatory flaw evaluation analysis, and may be used only for that purpose.

This information is part of that which will enable Westinghouse to:

(a) Extend the Reactor Vessel Cold Leg Nozzle Inspection Intervals

(b) Assist the customer to obtain NRC approval

Further this information has substantial commercial value as follows:

(a) Westinghouse plans to sell the use of the information to its customers for the purpose of extending the inservice inspection of the reactor vessel cold leg nozzles.

(b) Westinghouse can sell support and defense of extending the reactor vessel cold leg nozzle inservice inspection intervals.

(c) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar technical evaluation justifications and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

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Joseph M. Farley Nuclear Plant
Response to Request for Additional Information Concerning the Deferral of Inservice Inspection of Reactor Pressure Vessel Cold Leg Nozzle Dissimilar Metal Weld – Questions 1, 3, and 5

Enclosure 3

SNC Response to Request for Additional Information – Questions 1, 3, and 5
(Non-Proprietary)

NRC RAI #1

Discuss and demonstrate in detail why the reactor pressure vessel (RPV) cold leg dissimilar metal (DM) welds for which alternative is requested are bounded by the results of generic analyses documented in Enclosure 2, "Materials Reliability Program: PWR Reactor Coolant System Cold-Loop Dissimilar Metal Butt Weld Reexamination Interval Extension" (MRP-349) to the submittal (FNP-ISI-ALT-13) dated October 1, 2012, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12276A110), notably Figures 5-2, 5-3, and 5-4. Section 5.3.2 of Enclosure 2 documented that a 25 percent through-wall inside diameter (ID) weld repair was assumed in the flaw evaluations. Discuss why a 50 percent through-wall ID weld repair was not assumed. In addition, provide details on the depth of any fabrication defect repaired on the ID of the subject RPV DM welds.

SNC Response to RAI #1

The subject alternative seeks a deferral of volumetric examinations based on the generic topical report (MRP-349). The approach taken for the generic topical report and for the subject alternative was to address tolerance of cold leg locations to circumferential flaw growth, since circumferential flaw growth and tolerance is the primary element for the basis of the current required volumetric examination interval found in N-770-1. The subject alternative relies on the generic topical report's bounding analysis for circumferential flaws; this RAI response addresses how the cold leg DM welds are bounded by the results of the generic topical report. Axial flaw growth tolerance will be addressed in the SNC responses to RAIs #2 and #4, which will be provided no later than the agreed upon due date.

As discussed in Section 5.3.2 of MRP-349, a parametric study was performed to evaluate the residual stresses for different weld repairs and safe-end configurations present in the Westinghouse PWR fleet. The topical report concluded based on a comparison of the various residual stress distributions from the parametric study, that a long (length > 4.5") safe end with either a 25% **or** a 50% inside surface weld repair would produce limiting primary water stress corrosion cracking (PWSCC) crack growth results. A high (565°F) and a low (535°F) cold leg operating temperature were also considered in the evaluation to represent the range of operating temperatures in the fleet. While case studies were conducted with a 50% inside surface repair, the results produced showed that the 25% ID repair was the most conservative; those results were therefore presented in the topical report.

The figure directly relevant to FNP-ISI-ALT-13 from MRP-349 is Figure 5-4 which depicts four safe-end length and RPV inlet temperature combinations, as Figures 5-2 and 5-3 pertain to a study for reactor coolant pump nozzles. Based on the circumferential crack growth results shown in Figure 5-4, the bounding combined case of a 25% inner diameter repair, higher cold leg temperature (565°F), and longer safe end, a circumferential flaw will not propagate from an initial depth/thickness ratio of 15% to an unacceptable depth/thickness ratio (57%) per IWB-3600 of Section XI in ten years of continued operation. The results presented in Figure 5-4 are not representative of a single plant. These results are based on the limiting thickness in the Westinghouse PWR fleet combined with the limiting piping loads from another plant in the Westinghouse PWR fleet; therefore, the results presented in MRP-349 provide a conservative analysis.

Specific to Farley Nuclear Plant (FNP) Units 1 and 2, the limiting configuration in Figure 5-4 is higher in temperature (more activation energy) than the Unit 1 (nominal 537 °F) or Unit 2 (nominal 538 °F) configurations. For the temperature (535°F) more closely related to FNP

(537°F, 538°F nominal), in neither the short or long safe end case does a circumferential flaw propagate from 15% to an unacceptable depth/thickness ratio (57%) per IWB-3600 of Section XI in less than 20 years.

Also specific to FNP Units 1 and 2, the generic analysis assumption of a 25% ID repair is more limiting when compared with the repair history of the cold leg DM welds. The cold leg welds had no repairs other than pre-stress relief butter repairs for FNP Unit 1 and only one weld repair on FNP Unit 2. For the FNP Unit 2 weld repair, the weld traveler from the reactor vessel fabricator shows that this weld repair was necessary due to excessive porosity detected during the radiographic examination, and that the repair was performed by excavating from the outer diameter (OD) with specific restraints on proximity to the inner diameter and butter-carbon steel bond line. The repair welding used alloy 182 filler material. The specific weld residual stresses for this repair have not been modeled, but OD repairs were modeled in MRP-114 along with multiple other repair scenarios. The results of the OD repair modeling are summarized in the following paragraph from MRP-114:

> *3.5 Repaired Condition*
>
> *Figures 3-4 and 3-5 show the residual stress results for the RPV outlet nozzle for repaired conditions (Reference 2). Figure 3-4 shows that the axial residual stress is significantly compressive for the case where the repair is finished on the outside surface of the pipe. The stress distribution would not drive flaws through-wall even if initiation were to occur. Figure 3-5 shows that the residual stress is tensile for the case when the repair is completed on the inside surface. These results demonstrate that the locations where the weld repair is completed on the outside surface are not a concern as it results in stress distributions similar to the as-welded (unrepaired) condition. However, since the residual stress is significantly tensile on the inside surface for the case where the repair is completed on the inside surface, crack initiation and continued propagation is a concern and warrants additional evaluation. Repairs that were completed on the outside surface are not considered further in this evaluation.*

NRC RAI #3

In order for the staff to perform a confirmatory flaw evaluation, provide the following information for the subject RPV cold leg DM welds for which alternative is requested.

SNC Note Regarding RAI #3

Please note, in preparing a response to RAI #2, SNC is assuming a 50% ID repair for the site specific flaw evaluation. This is conservative based on SNC review of the repair history as noted in response to RAI #1. In summary, the review demonstrates that there were no repairs performed from the ID of the DM weld surface, and that, with one exception, all repairs were to the Alloy 182 butter welds prior to vessel stress relief. The single repair performed after vessel stress relief was performed from the OD surface. The weld repair was sufficiently documented with detailed instructions to perform repairs from the OD surface and with excavation limits on proximity to the ID surface.

NRC RAI #3a

Diameter and thickness of pipes or welds.

SNC Response to RAI #3a

The ID of the weld is 27.47 inches in diameter. The thickness of the weld is 3.27 inches.

NRC RAI #3b

As-built length of safe-ends.

SNC Response to RAI #3b

The FNP safe ends are 4.7 inches from design drawings, 4.56 inches based on Unit 1 NDE data, and 4.54 inches based on Unit 2 NDE data. For conservatism in SNC's response to RAI #2, 4.7 inches will be used.

NRC RAI #3c

Discussion on welding process or procedure (e.g., how the RPV nozzle is welded to the safe end and the safe end is welded to pipe). Include a discussion on whether, or how, the process affects the residual stresses in the subject DM welds.

SNC Response to RAI #3c

The RPV low alloy steel (LAS) nozzles were buttered with alloy 182 and then stress relieved with the entire reactor vessel. The stainless steel safe-ends were then welded onto the nozzles at the RPV fabricator (CE) with Alloy 82/182 filler material. The OD and ID of the single –V groove dissimilar metal welds were machined to the final weld configuration. The safe ends were then machined with the pipe side weld prep and field welded to the stainless steel RCS loop elbow with a stainless steel weld. As discussed in response to RAI #1, there were no ID repairs made to the cold leg welds; therefore the residual stresses in the subject DM welds are expected to be lower than either the 25% ID or 50% ID repair case.

NRC RAI #3d

The bounding residual axial stress profiles used in the analysis to support results shown in Figures 5-2 and 5-3 of MRP-349.

SNC Response to RAI #3d

As stated in response to RAI #1, the figure directly relevant to FNP-ISI-ALT-13 from MRP-349 is Figure 5-4. The axial residual stress profile used is shown as follows:

NRC RAI #5

Enclosure 1 to FNP-ISI-ALT-13, stated that the baseline examinations by ultrasonic testing (UT) were performed on Farley, Units 1 and 2, in 2007 and 2010. Discuss whether there were any indications detected in the subject RPV DM welds during baseline examinations by UT.

SNC Response to RAI #5

No indications were detected in either the required volumetric examinations (UT) or the owner-elected surface examinations (ET) conducted during either 2007 or 2010. The volumetric examinations were conducted using automated encoded ultrasonic techniques by an inspection vendor qualified to ASME Code Section XI Appendix VIII Supplement 10 criteria.