TVA

Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37384-2000

June 24, 2003

10 CFR 50.90

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

Gentlemen:

In the Matter of	)	Docket Nos. 50-327
Tennessee Valley Authority	)	50-328

SEQUOYAH NUCLEAR PLANT (SQN) - REVISED RESPONSES TO NRC QUESTIONS 1, 2, and 3 FOR TECHNICAL SPECIFICATION (TS) CHANGE 00-14, "PRESSURE TEMPERATURE LIMITS REPORT (PTLR) AND REVISED TOPICAL REPORT (WCAP-15984, REVISION 1), REACTOR CLOSURE HEAD/VESSEL FLANGE REQUIREMENTS EVALUATION FOR SEQUOYAH UNITS 1 AND 2" (TAC NOS. MB6436 AND MB6437)

References:

1. NRC letter to TVA dated February 14, 2003, "Sequoyah Nuclear Plant, Units 1 and 2 - Request for Additional Information Regarding Technical Specification (TS) Change No. 00-14, 'Pressure Temperature Limits Report (PTLR) and Request for Exemption From the Requirements of 10 CFR 50, Appendix G,' (TAC Nos. MB6436 and MB6437)"

2. TVA letter to NRC dated March 28, 2003, "Sequoyah Nuclear Plant (SQN) - Response To Request For Additional Information (RAI) Regarding Technical Specification (TS) Change 00-14, 'Pressure Temperature Limits Report (PTLR) And Request For Exemption From The Requirements Of 10 CFR 50, Appendix G,' (TAC Nos. MB6436 And MB6437)"

A001

3. TVA letter to NRC dated December 19, 2002, "Sequoyah Nuclear Plant (SQN) - Westinghouse Electric Company Topical Report (WCAP-15984) for Technical Specification Change No. 00-14, 'Pressure Temperature Limits Report (PTLR) and Request for Exemption from the Requirements of 10 CFR 50, Appendix G' "

This letter provides revised responses to NRC RAI Questions 1, 2, and 3 as documented in Reference 1 and WCAP-15984, Revision 1, "Reactor Closure Head/Vessel Flange Requirements Evaluation for Sequoyah Units 1 and 2." The revised responses to Questions 1, 2, and 3 contain additional details requested by the staff during an April 4, 2003 telephone conference call. The revised responses supersede the responses previously provided in Reference 2.

By the Reference 3 letter, TVA submitted a SQN specific WCAP-15984 that provided the basis for the exclusion of the reactor vessel flange region as part of the development of SQN's heatup and cooldown limits. Enclosed is a revision to WCAP-15984 that was requested by the staff to provide more details of the stress analysis and to provide more detailed discussion of the effects of thermal aging on closure head materials. The revised WCAP supersedes the information provided by Reference 3. Additionally, TVA anticipates providing revised PTLR's and supporting topical reports.

Enclosure 2 provides the application for withholding and affidavit (CAW-03-1634) signed by Westinghouse, the owner of the information, as well as the proprietary information notice and copyright notice. The application for withholding and the affidavit set forth the basis on which the Westinghouse proprietary information may be withheld from public disclosure by NRC and addresses the considerations listed in Paragraph (b)(4), Section 2.790 of NRC regulations.

Accordingly, it is respectfully requested that the information that is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR, Section 2.790.

Enclosure 3 provides the non-proprietary version of WCAP-15984, Revision 1. Enclosure 4 provides the proprietary version.

Correspondence, with respect to the copyright or proprietary aspects of the subject report or the supporting Westinghouse affidavit, should reference CAW-03-1634 and should be addressed to:

H. A. Sepp
Manager of Regulatory Compliance and Plant Licensing
Westinghouse Electric Company,
P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355

This letter is being sent in accordance with NRC RIS 2001-05. There are no commitments contained in this submittal. Please direct questions concerning this issue to me at (423) 843-7170 or J. D. Smith at (423) 843-6672.

Sincerely,

Pedro Salas
Licensing and Industry Affairs Manager

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 24 day of June 2003

Enclosures
cc (Enclosures):

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ENCLOSURE 1

SEQUOYAH NUCLEAR PLANT (SQN)
REVISED RESPONSES TO NRC QUESTIONS 1, 2, AND 3

TECHNICAL SPECIFICATION (TS) CHANGE NO. 00-14,
DOCKET NOS. 50-327 AND 50-328

NRC Question 1

Regarding the discussion on page 4-1, "These results [the stresses for boltup and steady-state operation given in Table 4-1] were taken from a finite element analysis of the heatup/cooldown process, and the boltup was determined to be the most limiting time step for the entire heatup/cooldown transient."

Provide a summary which identifies how the finite element analysis (FEA) was performed, including important analysis variables (e.g., mesh size/element used, convergence criteria, thermal transient time step magnitude, boundary conditions, etc.). The level of detail provided should be such that the U.S. Nuclear Regulatory Commission (NRC) staff will have reasonable assurance regarding the acceptability of the licensee's FEA process and input variables. Provide stress analysis results consistent with the level of detail provided in Table 4-1) and through wall temperature distributions at twenty evenly distributed points along the most limiting heatup/cooldown transient which was analyzed.

TVA Response to NRC Question 1

1.0 Stress Analysis

The stress analysis was performed using an axisymmetric model shown in the cross section in Figure 1-1, where the cross section of interest is highlighted as Section 3.

There are 54 studs that join the reactor vessel head to the closure flange. These studs are equally spaced around the vessel. Two-dimensional axisymmetric elements were used to model the closure flange region of the reactor vessel. There are a total of 996 elements and 1139 nodes in the model.

The bulk of the model is comprised of isotropic elements. Constant strain elements were used for all the orthotropic elements, as well as for any three-node isotropic elements.

Four-node isoparametric elements were used for all the four node isotropic elements, which comprise the bulk of the model.

To model the nuts, bolts, and the flange material between the bolt holes, orthotropic elements were used. These elements were assigned a very low stiffness value in the hoop direction to account for the absence of any circumferential loads between adjacent members.

The stainless steel clad, which covers the internal surfaces of the vessel, was considered to be non-structural, and was not included as part of the finite element model. The insulating effect of the clad on model temperatures was included by introducing a modified heat transfer coefficient.

1.1 Mechanical Boundary Conditions

Physically, the reactor vessel shell will displace laterally, and the crown of the head does not displace laterally. To approximate this behavior, the bottom surface of the model in the shell region and the vertical surface of the model at the vessel crown were both assumed to be resting on rollers. This arrangement of restraint is assumed to correspond to the actual behavior of the vessel and prevents any rigid body motion of the model.

The initial bolt pre-load tensioning is designed to be so large that the mating flanges of the closure head and shell will never be separated by the contained coolant pressure. Because of this design, only bearing stresses can exist at the interface between the mating flanges of the head and shell. When the contained coolant pressure is zero, these bearing stresses exactly balance the bolt pre-load. As the coolant pressure increases, the flange bearing stresses diminish, since the coolant pressure is now helping the flange bearing stresses in opposing the initial bolt pre-load.

In the absence of contained pressure, the bolt pre-load will rotate the two flanges about a pivot point, so as to reduce the gap. With increasing pressure, the two flanges will rotate in the opposite direction, tending to increase the gap.

The above consideration dictates that for the finite element model, the head flange and the shell flange must be mechanically coupled, to carry the mating surface bearing load, as well as to permit free rotation of the flange. The bolt pre-load is designed to be much larger than the contained pressure operating loads. Therefore, it is assumed that during normal operating conditions, the mating surfaces will be pivoted, to reduce the gap and the bearing load will be mostly carried near the pivot point. In keeping with this assumption, the head and shell are mechanically coupled only at one corner node nearest the studs to allow completely free rotations.

Choosing to couple mechanically at only the pivot location, as discussed above, should tend to increase the bending stresses at all the selected Sections 1 through 5 shown on Figure 1-1. Mechanical coupling at more than one node, or all the nodes on the flange mating surface would have prevented free rotation of the flanges and reduced the bending stresses.

Based on the above, the coupling scheme is judged to be realistic and slightly conservative.

1.2 Thermal Boundary Conditions

For thermal analysis, all exterior surfaces of the model were assumed to be perfectly insulated and, therefore, adiabatic. Also, no heat flow was assumed through the external gap between the vessel flange and the head flange.

When the inside surface of the vessel is subjected to thermal transients, the primary mechanism of heat transfer is forced convection. The thermal properties of the metal are computed as linear functions of temperature.

A uniform film coefficient was assumed for the entire inside surface of the vessel, which includes the effect of the clad on the convective heat transfer from the coolant to the vessel wall.

All the nodes on the flange mating surfaces were thermally coupled on the finite element model. It was judged that despite the rotations discussed above, the thermal resistance across the flange mating surfaces will not be significant. This thermal resistance is always ignored in reactor vessel stress reports.

1.3 Bolt Pre-Load

A bolt pre-load was simulated by applying a 500 degree Fahrenheit temperature differential between the flange and the bolts. Again a factor was obtained to relate the stresses, due to the dummy load, to the actual stresses caused by the 116.7 kip/inch pre-load in the reactor vessel.

This factor was of the form

$$f = \frac{actual\ pre-load\ x\ 2\pi r}{A\,(\sigma\ dummy)\ avg.} = .7059$$

Where r = radius of the bolt circle

A = area of the finite element model simulating the bolts

σ = stress obtained by applying the dummy load

The 116.7 kips/inch pre-load from the bolts is the amount prescribed for the Sequoyah Units 1 and 2 reactor pressure vessel to prevent the coolant water pressure from separating the flange mating surfaces.

1.4 Stress Results

The stress analysis was carried out with both temperature and pressure varying with time, and for the heatup and cooldown transient, 15 time steps were analyzed. The heatup/cooldown rate was 100 degrees/hr. The results for each time step are provided in Table C-1 of Appendix C, WCAP-15984-P Revision 1, showing both hoop and axial (meridional) stresses for the upper head to flange transition region. The stresses shown in Table C-1 include thermal and pressure stresses, as well as bolt-up stresses for each time step.

To obtain the meridional stresses, the stresses were rotated from the cylindrical coordinate system used in the model using standard formulae. The hoop stresses were already in the correct orientation, so no rotation was necessary. As may be clearly seen in Table C-1 of Appendix C of WCAP-15984-P, Revision 1, the meridional stress was the governing component.

A set of stress intensity factor calculations were carried out to determine the governing time step for the analysis, since the stresses were very similar for several time steps. The Raju and Newman solution for an outside flaw in a cylinder was used, with a postulated surface flaw on the outer surface of the head, with a length six times its depth, oriented perpendicular to the maximum meridional stresses. The governing time step was found to be the end of heatup, or the time step at 344.2 minutes, as shown in Figure 4-2 of WCAP-15984-P, Revision 1.

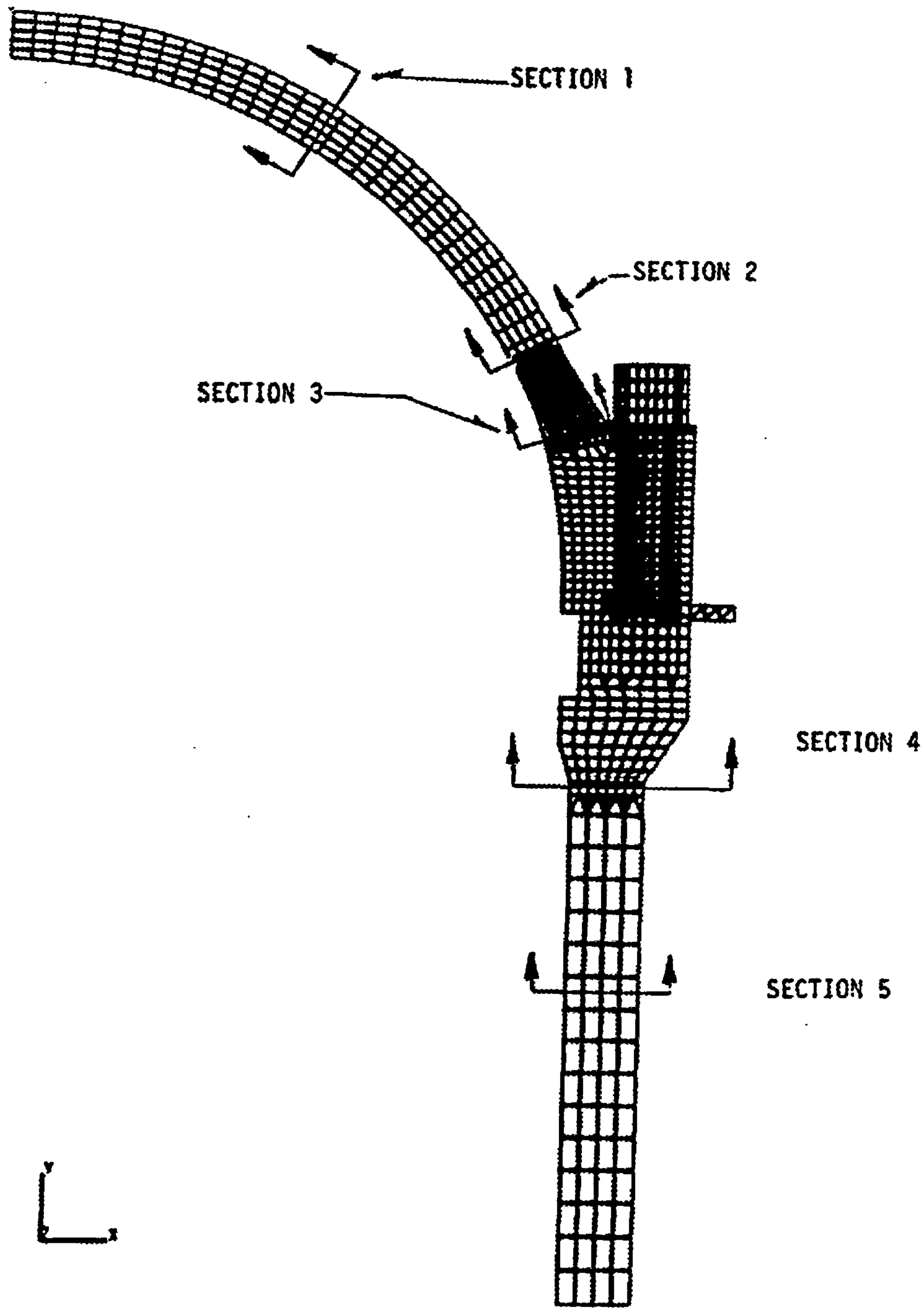

Figure 1-1 Finite Element Model for Closure Head Region, Sequoyah Units 1 and 2

NRC Question 2

Regarding the information provided on page 4-2 on the effect of thermal aging:

a. Provide the chemical composition (weight percent copper and nickel) of the Sequoyah, Unit 1 and Unit 2, reactor pressure vessel (RPV) closure head region materials.

b. Recent work supported by the NRC's Office of Nuclear Regulatory Research has led to the development of new RPV embrittlement models which incorporate terms that have the effect of a "thermal aging" (time-at-temperature) function (original work documented in NUREG/CR-6551, "Improved Embrittlement Correlations for Reactor Pressure Vessel Steel"). The most recent version of the proposed embrittlement model is included below, along with suggested input value definitions:

$$\text{Shift in } RT_{NDT} = A * f(T_c) * f(P) * f_1(\varphi t) + B * f(Ni) * f(Cu) * f_2(\varphi t) + Bias$$

where: $A = 8.86 \times 10^{-17}$ for welds
9.30×10^{-17} for forgings
12.7×10^{-17} for plates

$$f(T_c) = \exp(19310/[T_c + 460])$$

$$f(P) = (1 + 110 * P)$$

$$f_1(\varphi t) = (\varphi t)^{0.4601}$$

B = 230 for welds
132 for forgings
156 for plates
206 for plates in Combustion Engineering fabricated RPVs

$$f(Ni) = (1 + 2.40 * Ni^{1.250})$$

$$f(Cu) = 0, \text{ if } Cu < 0.072 \text{ wt\%}$$
$$= (Cu - 0.072)^{0.659}$$

$$f_2(\varphi t) = 0.5 + 0.5 * \tanh([\log(\varphi t + 4.579 \times 10^{12} * t) - 18.265]/0.713)$$

$$Bias = 0, t < 97{,}000 \text{ hrs}$$
$$= 9.4°F, t > 97{,}000 \text{ hrs}$$

and: *T_c = In this application, the temperature of the coolant at the RPV flange*
P = Material phosphorous content, wt%
φt = Neutron fluence at RPV flange at EOL [end of life]
(10^{15} n/cm^2 as a nominal value, unless information exists which would suggest that the fluence at the flange could be marginally greater)
Ni = Material nickel content, wt%
Cu = Material copper content, wt%
t = Time of full power operation at end of license conditions in hours (nominally 280,000 hrs)

Making the conservative assumption that the embrittlement model equation may be directly applied to the evaluation of thermal aging effects for RPV flange materials (with the effective neutron fluence set to a nominally small value), evaluate what the predicted shift in RT_{ndt} would be for the Sequoyah, Unit 1 and Unit 2, RPV closure head region materials, and provide the predicted final RT_{ndt} values for these materials at the current end of license condition for the units.

Assess what impact these values would have on the conclusions drawn in WCAP-15984 and the licensee's exemption request.

<u>TVA Response to NRC Question 2</u>

Please refer to Appendix B of Revision 1 to WCAP-15984-P for a detailed discussion of thermal aging of ferritic RPV steels at reactor operating temperatures.

<u>NRC Question 3</u>

Regarding the discussion on page 5-1 on the basis for the reference flaw size:

Provide information that explains what RPV head flange region inservice inspections (when the inspections were conducted, the extent of coverage achieved, ultrasonic transducers used, etc.) have been conducted at Sequoyah, Units 1 and 2, relative to the discussion in WCAP-15984 regarding the quality of inspections cited to support the assumed reference flaw size. More specifically, provide an evaluation that demonstrates how the inspections conducted at Sequoyah, Units 1 and 2, support the assumption of a 0.1T flaw size in the flange evaluation.

TVA Response to NRC Question 3

Inspection History:

The TVA Sequoyah Unit 1 and 2 closure head to flange welds were examined during the second 10-year in-service inspection (ISI) interval to the 1989 Edition of Section XI. Magnetic particle and ultrasonic examination of the examination volume (Figure IWB-2500-5) was performed as follows:

Magnetic Particle and Ultrasonic Examinations

Unit 1:

Approximately 50% of the weld length was examined (September 1998, second interval, first period). No recordable indications.

The remainder (50%) of the weld was examined (March 2000 - second interval, second period). No recordable indications.

Unit 2:

Approximately 50% of the weld length was examined (April 1999 second interval, first period). No recordable indications.

The remainder (50%) of the weld was examined (October 2000 - second interval, second period). No Recordable Indications.

TVA submitted two requests for relief (RFR's) to the NRC for limited ultrasonic examination coverage. These RFR's (1-ISI-2, Part 1 and 2-ISI-2, Part 1) were submitted as part of the second interval 10-year inspection program plan. The RFR's were granted by a safety evaluation report (SER) to TVA in a letter to O.J. Zeringue (TVA) from Ronald W. Hernan, Senior Project Manager, NRC, dated April 27, 1998 (TAC Nos. MB4115 and MB4116).

Magnetic Particle Examination Techniques:

In order to detect flaws open to the outer diameter (OD) surface, which is the highest stress region in the closure head, a magnetic particle examination of the weld and flex area was performed prior to each ultrasonic examination using TVA procedure N-MT-6. This examination procedure was written in accordance with Article 7 of the ASME Boiler and Pressure Vessel Code Section V. The acceptance standards and extent of coverage was in accordance with Section XI of the ASME Boiler and Vessel Code examination, category B-A. One hundred percent of the required examination surface per Figure IWB-2500-5 was achieved, and no indications recorded.

Ultrasonic Examination Techniques:

In addition to the magnetic particle examination, an ultrasonic examination was performed in accordance with TVA procedure N-UT-9. Procedure N-UT-9 was written to comply with ASME Section XI, Appendix I, Article 4 of ASME Section V, and NUREG-1.150. The ultrasonic acceptance standards were in accordance with Section XI requirements.

The ultrasonic examination system was calibrated on a basic calibration block. In order to record and evaluate flaws throughout the volume of the weld, a distance amplitude correction curve (DAC) was generated from side drilled holes and a 2% (approx. 0.150″ deep) inside diameter (ID) notch into the base material. Regulatory Guide 1.150 requires near-surface resolution and verification for the detection of indications in the near-field region. TVA typically complies with this requirement by ensuring that a response from a 3/32 inch diameter, 0.3 inch deep, side-drilled hole from a rompas block can be resolved. The basic calibration block far-surface notch is used for far-surface resolution.

Scanning of the component is performed at a minimum of 6 decibel (dB) over the reference gain at which the DAC is established. The increase in scanning sensitivity further increases the probability of detection. The 1989 Edition of ASME Section XI, Appendix I requires that reflectors that produce a response greater than 20% DAC be investigated. In addition, the examiner is required to determine whether the indication originates from a flaw or is a geometric indication.

During the second ISI interval, greater than 95% of the extent of examination volume from the dome side was examined for both units 1 and 2 with a 45- and 60-degree shear wave search unit looking for flaws oriented parallel to the weld. No recordable indications were found.

Summary

The magnetic particle test (MT) surface examination will detect flaws open to the surface. The ultrasonic examinations will detect flaws near the surface and throughout the volume (0.3 inches from the outside diameter throughout the volume to the inside diameter approximately 7.2 inches). The ultrasonic examinations are conducted with scanning sensitivities (2X or +6 dB) over calibration.

The recording requirements for ultrasonic examination are extremely low (20% DAC). The ultrasonic examinations were calibrated on a 2% notch (0.150″) from calibration block SQ-46 into the ferritic base material. The ultrasonic response from the 2% notch is extremely sensitive when compared to a 0.1T (0.72″) flaw which is of concern. A high percentage of coverage (95%) from one side was obtained with the ultrasonic examination. A high percentage of coverage (100%) was obtained with the MT examination. There were no indications recorded with either the MT or UT examinations for either the Unit 1 or Unit 2 head to flange weld.

Conclusion

Based on the ability of the ultrasonic system to detect near and far surface reflectors combined with the magnetic particle surface examination, there is very high probability that flaws 0.1 T will be detected for the entire volume as defined in WCAP-15984-P, Revision 1. The probability of detection for flaws on the high stress region of the outer surface of the closure head is even higher, so the assumption of a flaw with a depth of 10% of the thickness is justified.

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT (SQN) UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

WESTINGHOUSE ELECTRIC COMPANY

APPLICATION FOR WITHHOLDING AND AFFIDAVIT

(CAW-03-1634)

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 2.790 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 2.790(b)(1).

CAW-03-1634

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Westinghouse

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Our ref: CAW-03-1634

May 7, 2003

APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE

Subject: WCAP-15984-P, Revision 1, "Reactor Vessel Closure Head/Vessel Flange Requirements Evaluation for Sequoyah Units 1 and 2", April 2003 (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-03-1634 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 2.790 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying affidavit by Tennessee Valley Authority (TVA).

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-03-1634 and should be addressed to the undersigned.

Very truly yours,

H. A. Sepp, Manager
Regulatory Compliance and Plant Licensing

Enclosures

cc: S. J. Collins
D. Holland
B. Benney

bcc: H. A. Sepp (ECE 4-7A) 1L, 1A
R. Bastien, (Brussels, Belgium) 1L, 1A
C. Brinkman, 1L, 1A (Westinghouse Electric Co., 12300 Twinbrook Parkway, Suite 330, Rockville, MD 20852)
RLE Administrative Aide (ECE 4-7A) 1L, 1A (letters w/affidavits only)

CAW-03-1634

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared H. A. Sepp, 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:

H. A. Sepp, Manager
Regulatory Compliance and Plant Licensing

Sworn to and subscribed
before me this 7th day
of May, 2003

Sharon L. Fiori
Notary Public

SHARON L. FIORI COMMONWEALTH OF PENNSYLVANIA NOTARY PUBLIC

Notarial Seal
Sharon L. Fiori, Notary Public
Monroeville Boro, Allegheny County
My Commission Expires January 29, 2007
Member, Pennsylvania Association Of Notaries

(1) I am Manager, Regulatory Compliance and Plant Licensing, 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 the Westinghouse Electric Company LLC.

(2) I am making this Affidavit in conformance with the provisions of 10CFR Section 2.790 of the Commission's regulations and in conjunction with the Westinghouse application for withholding accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by the Westinghouse Electric Company LLC 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 2.790 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 10CFR Section 2.790, 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 WCAP-15984-P, Revision 1, "Reactor Vessel Closure Head/Vessel Flange Requirements Evaluation for Sequoyah Units 1 and 2", April 2003 (Proprietary) being transmitted by TVA letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information, as submitted for use by Tennessee Valley Authority for Sequoyah Units 1 and 2, is expected to be applicable for other submittals in response to certain NRC requests for information to support the Reactor Vessel Closure Head/Vessel Flange Requirements.

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

(a) Provide documentation of the analysis and methods used to show that the use of the newly accepted K_{Ic} fracture toughness for reactor vessel closure head flange considerations leads to the conclusion that the flange requirement specified in 10CFR50 Appendix G can be eliminated for Sequoyah Units 1 and 2.

(b) Assist the customer to respond to NRC requests for information.

Further this information has substantial commercial value as follows:

(a) Westinghouse plans to sell the use of similar information to its customers for purposes of meeting NRC requirements for licensing documentation.

(b) Westinghouse can sell support and justification of the technology to its customers in the licensing process.

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 support documentation 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.