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Proprietary Information
Withhold from Public Disclosure

Richard J. St. Onge
Director, Nuclear Regulatory Affairs and
Emergency Planning

January 31, 2013 10 CFR 50.4

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

Subject: **Docket No. 50-361**
Response to Request for Additional Information (RAI 29)
Regarding Confirmatory Action Letter Response
(TAC No. ME 9727)
San Onofre Nuclear Generating Station, Unit 2

References:
1. Letter from Mr. Elmo E. Collins (USNRC) to Mr. Peter T. Dietrich (SCE), dated March 27, 2012, Confirmatory Action Letter 4-12-001, San Onofre Nuclear Generating Station, Units 2 and 3, Commitments to Address Steam Generator Tube Degradation

2. Letter from Mr. Peter T. Dietrich (SCE) to Mr. Elmo E. Collins (USNRC), dated October 3, 2012, Confirmatory Action Letter – Actions to Address Steam Generator Tube Degradation, San Onofre Nuclear Generating Station, Unit 2

3. Letter from Mr. James R. Hall (USNRC) to Mr. Peter T. Dietrich (SCE), dated December 26, 2012, Request for Additional Information Regarding Response to Confirmatory Action Letter, San Onofre Nuclear Generating Station, Unit 2

Dear Sir or Madam,

On March 27, 2012, the Nuclear Regulatory Commission (NRC) issued a Confirmatory Action Letter (CAL) (Reference 1) to Southern California Edison (SCE) describing actions that the NRC and SCE agreed would be completed to address issues identified in the steam generator tubes of San Onofre Nuclear Generating Station (SONGS) Units 2 and 3. In a letter to the NRC dated October 3, 2012 (Reference 2), SCE reported completion of the Unit 2 CAL actions and included a Return to Service Report (RTSR) that provided details of their completion.

By letter dated December 26, 2012 (Reference 3), the NRC issued Requests for Additional Information (RAIs) regarding the CAL response. Enclosure 2 of this letter provides the response to RAI 29.

Enclosure 2 of this submittal contains proprietary information. SCE requests that this proprietary enclosure be withheld from public disclosure in accordance with 10 CFR 2.390(a)(4). Enclosure 1 provides notarized affidavits from Mitsubishi Heavy Industries (MHI) and

P.O. Box 128
San Clemente, CA 92672

Proprietary Information
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Decontrolled Upon Removal From Enclosure 2

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NRC

Westinghouse Electric Company (WEC), which sets forth the basis on which the information in Enclosure 2 may be withheld from public disclosure by the NRC and addresses with specificity the considerations listed by paragraph (b)(4) of 10 CFR 2.390. Proprietary information identified in Enclosure 2 was extracted from MHI Report L5-04GA585, "Analytical Evaluation for Operational Assessment," and from WEC Report LTG-SGDA-12-80, "San Onofre Nuclear Generating Station Unit 2 MHI Replacement Steam Generator Responses to RAI 29," which are addressed in the affidavits. Enclosure 3 provides the non-proprietary version of Enclosure 2.

There are no new regulatory commitments contained in this letter. If you have any questions or require additional information, please call me at (949) 368-6240.

Sincerely,

Enclosures:

1. Notarized Affidavits
2. Response to RAI 29 (Proprietary)
3. Response to RAI 29 (Non-proprietary)

cc: E. E. Collins, Regional Administrator, NRC Region IV
J. R. Hall, NRC Project Manager, SONGS Units 2 and 3
G. G. Warnick, NRC Senior Resident Inspector, SONGS Units 2 and 3
R. E. Lantz, Branch Chief, Division of Reactor Projects, NRC Region IV

ENCLOSURE 1

Notarized Affidavits

MITSUBISHI HEAVY INDUSTRIES, LTD.

AFFIDAVIT

I, Jinichi Miyaguchi, state as follows:

1. I am Director, Nuclear Plant Component Designing Department, of Mitsubishi Heavy Industries, Ltd. ("MHI"), and have been delegated the function of reviewing the referenced MHI technical documentation to determine whether it contains information that should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4) as trade secrets and commercial or financial information that is privileged or confidential.

2. In accordance with my responsibilities, I have determined that the following MHI documents and drawings contain MHI proprietary information that should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4). The drawings in their entirety are proprietary and those pages of the documents containing proprietary information have been bracketed with an open and closed bracket as shown here "[ ]" / and should be withheld from public disclosure.

   MHI documents and drawings
   Document: L5-04GA561, L5-04GA564, L5-04GA571, L5-04GA585, L5-04GA591
   Drawings: L5-04FU101 thru 108

3. The information identified as proprietary in the enclosed document has in the past been, and will continue to be, held in confidence by MHI and its disclosure outside the company is limited to regulatory bodies, customers and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and is always subject to suitable measures to protect it from unauthorized use or disclosure.

4. The basis for holding the referenced information confidential is that it describes unique design, manufacturing, experimental and investigative information developed by MHI and not used in the exact form by any of MHI's competitors. This information was developed at significant cost to MHI, since it is the result of an intensive MHI effort.

5. The referenced information was furnished to the Nuclear Regulatory Commission ("NRC") in confidence and solely for the purpose of information to the NRC staff.

6. The referenced information is not available in public sources and could not be gathered readily from other publicly available information. Other than through the provisions in paragraph 3 above, MHI knows of no way the information could be lawfully acquired by organizations or individuals outside of MHI.

7. Public disclosure of the referenced information would assist competitors of MHI in their design and manufacture of nuclear plant components without incurring the costs or risks associated with the design and the manufacture of the subject component. Therefore, disclosure of the information contained in the referenced document would have the following negative impacts on the competitive position of MHI in the U.S. and world nuclear markets:

   A. Loss of competitive advantage due to the costs associated with development of technologies relating to the component design, manufacture and examination. Providing public access to such information permits competitors to duplicate or mimic the methodology without incurring the associated costs.

   B. Loss of competitive advantage of MHI's ability to supply replacement or new heavy components such as steam generators.

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 2 day of August, 2012.

Jinichi Miyaguchi

Jinichi Miyaguchi,
Director- Nuclear Plant Component Designing Department
Mitsubishi Heavy Industries, LTD

220

AUG. -2. 2012

Masahiko Kubota
Kobe District Legal Affairs Bureau
NOTARY
44 Akashimachi, Chuo-ku
Kobe, Japan

Sworn to and subscribed

Before me this 2 day

of August, 2012

Masahiko Kubota

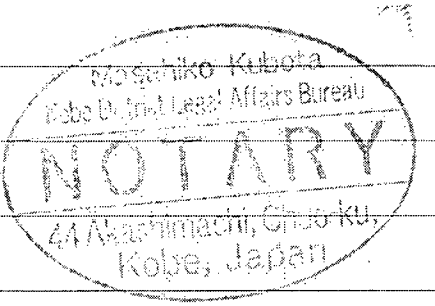
Notary Public

My Commission Expires _____

登簿平成２４年第２２０号

認　　証

嘱託人　三菱重工業株式会社　原子力事業部　原子力誠三総括部　原子力機器設計部　部長　宮口仁一　は本職の面前で添付書面に　署名　した。



よって認証する。

平成２４年８月２日

本職役場に於て

神戸市中央区明石町４４番地

神戸地方法務局所属

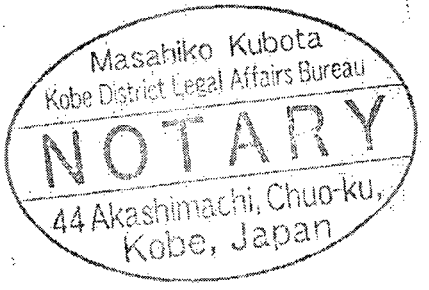
公証人　窪田正彦

公　証　人　役　場

Registered Number 220 Date AUG.-2.2012

NOTARIAL CERTIFICATE

This is to certify that JINICHI MIYAGUCHI , Director-Nuclear Plant Component Designing Department MITSUBISHI HEAVY INDUSTRIES, LTD has affixed his signature in my very presence to the attached document.



Masahiko Kubota

MASAHIKO KUBOTA

Notary

44 Akashimachi, Chuo-Ku,

Kobe, Japan

Kobe District Legal Affairs Bureau

(面前法2)

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 21st day of January 2013

Notary Public

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Renee Giampole, Notary Public
Penn Township, Westmoreland County
My Commission Expires September 25, 2013

(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 LTR-SGDA-12-80 P-Attachment, "San Onofre Nuclear Generating Station Unit 2 MHI Replacement Steam Generator Response to RAI 29," dated January 21, 2013, for submittal to the Commission, being transmitted by Southern California Edison Letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse is that associated with the calculation of fluidelastic excitation of steam generator tubes and may be used only for that purpose.

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

(a) Respond to Nuclear Regulatory Commission (NRC) Request for Additional Information regarding stability ratios calculated for certain anti-vibration bar (AVB) support conditions for the San Onofre Nuclear Generating Station Unit 2 steam generators.

Further this information has substantial commercial value as follows:

(a) Westinghouse plans to sell the use of similar information to its customers for the purpose of evaluating the impact of fluidelastic excitation on steam generator tube integrity.

(b) Westinghouse can sell support and defense of the thermal hydraulic analysis of secondary side flow field in the steam generator shell.

(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 information 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.

ENCLOSURE 3

SOUTHERN CALIFORNIA EDISON

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

REGARDING RESPONSE TO CONFIRMATORY ACTION LETTER

DOCKET NO. 50-361

TAC NO. ME 9727

Response to RAI 29

(NON-PROPRIETARY)

RAI 29

Reference 5, Figures 2-12 and 2-13 – Provide similar figures for Case 78 (all AVBs missing).

RESPONSE

Note: Reference 5 is the Westinghouse Operational Assessment, SG-SGMP-12-10, Revision 3. Figures 2-12 and 2-13 of this report respectively contain the out-of-plane excitation ratio and in-plane stability ratio maps for Case 60 (seven ineffective AVB supports) at 70% power.

The requested out-of-plane excitation ratio and in-plane stability ratio maps for Westinghouse Case 78 at 70% power are attached, representing the extreme condition where all twelve anti-vibration bar (AVB) supports are ineffective. No Unit 2 steam generator tubes have this support condition; hence, there are no tubes with excitation or stability ratios as indicated in these figures. A comparison of in-plane stability ratios calculated by Westinghouse and MHI shows that Westinghouse in-plane stability ratios are higher for the hypothetical support condition represented by Case 78. However, over the range of actual AVB support conditions present in Unit 2 steam generators, in-plane stability ratios calculated by Westinghouse agree with those calculated by MHI.

No Tubes in Unit 2 Have Twelve Ineffective AVB Supports

Westinghouse determined that there are no tubes in the Unit 2 steam generators with twelve ineffective AVB supports from their review of the eddy current data for SG 2E-088 and SG 2E-089. The review included approximately 600 tubes in SG 2E-088 and approximately 800 tubes in SG 2E-089 with indications of tube-to-AVB wear. Westinghouse used the eddy current data to identify appropriate AVB support cases for use in their flow-induced vibration (FIV) analysis. Defining ineffective AVB support locations as locations with AVB wear, Westinghouse determined the FIV analysis case applicable to each tube according to the number of consecutive ineffective AVB support locations.

[ ]

The Westinghouse finding that there are no tubes in Unit 2 steam generators with twelve ineffective AVB supports was independently corroborated by AREVA's analysis of probability of instability. For this analysis, AREVA performed Monte Carlo simulations of Unit 2 steam generators considering the variability of AVB support effectiveness at individual tube-to-AVB intersections in the steam generator. AREVA determined AVB support effectiveness from probabilistic distributions of tube-to-AVB

contact forces accounting for tube-to-AVB wear. The Monte Carlo simulations typically included 10,000 trials. Each trial individually modeled all tubes susceptible to in-plane fluid-elastic instability at 100% power (the model included approximately 1/5 of the bundle) and probabilistically sampled the number of effective AVB supports at a given operating time. To envelop conditions for the next Unit 2 operating interval, separate Monte Carlo simulations were performed at the beginning of cycle and at 6 months after the beginning of cycle. AREVA has reviewed these simulations and determined that there were no instances of a tube with twelve ineffective AVB supports in any of the 20,000 trials contained in these two simulations. AREVA's results demonstrate that there is no significant likelihood of Unit 2 steam generators having any tubes with the extreme AVB support condition represented by Case 78 at any time during the next operating interval.

Comparison between Westinghouse and MHI In-Plane Stability Ratio Results

Westinghouse compared the input parameters and methodology of their in-plane FIV analysis to the corresponding elements of MHI's FIV. Differences between the methods include:

1) Differences in thermal-hydraulic calculation methods: Westinghouse uses proprietary ATHOS pre-processors and post-processors. MHI uses the EPRI-standard version of ATHOS.

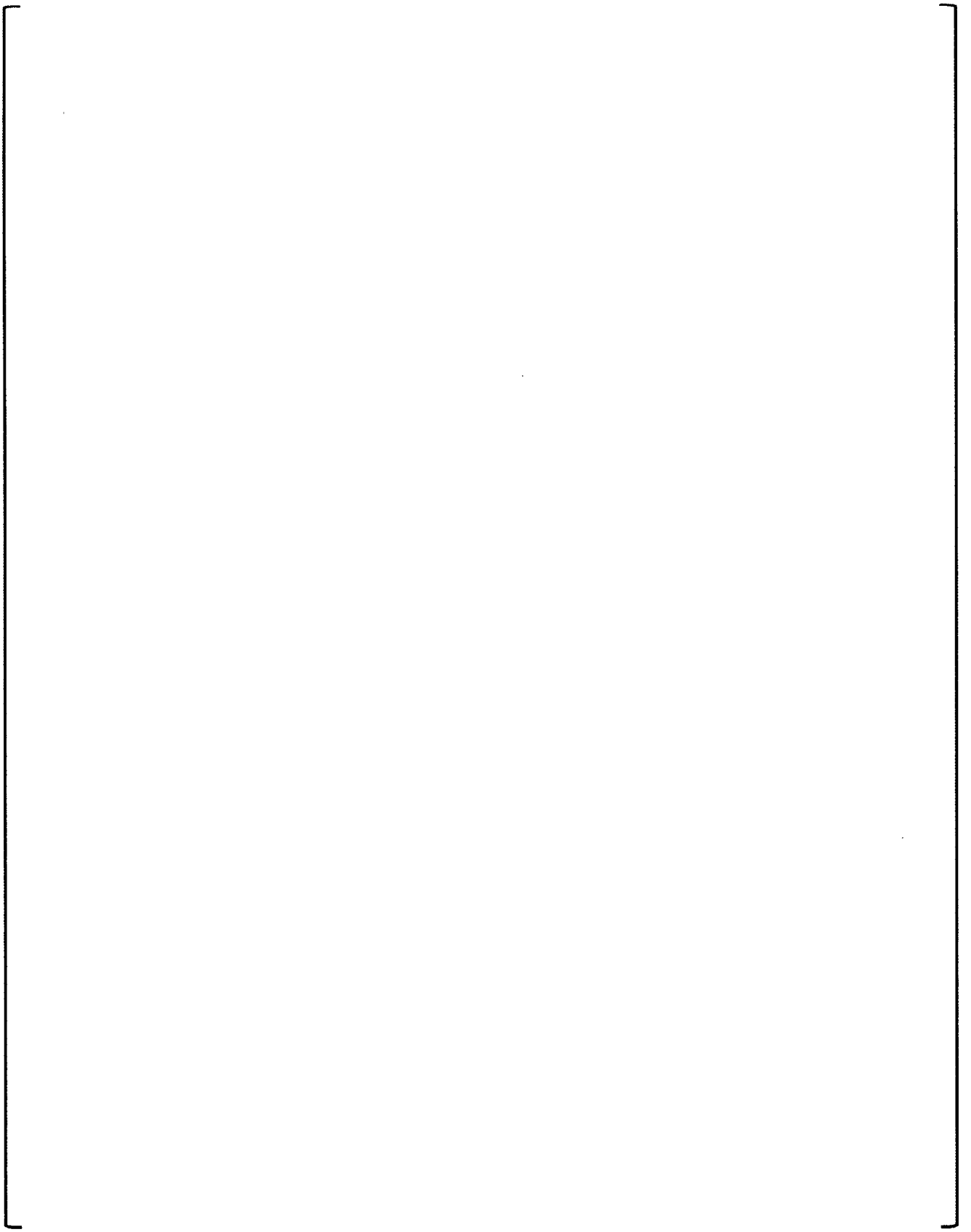
2) Differences in Connors' coefficient:

3) Differences in calculation of effective velocity: Westinghouse's approach conservatively maximizes the energy added to the tube by considering the resultant velocity normal to the tube axis while minimizing the energy removed by considering the velocity component in the direction of tube displacement. MHI's method calculates energy added to the tube using the component velocity in the direction of tube displacement and considers energy removed both axial and normal to the tube axis over the full length of the tube.

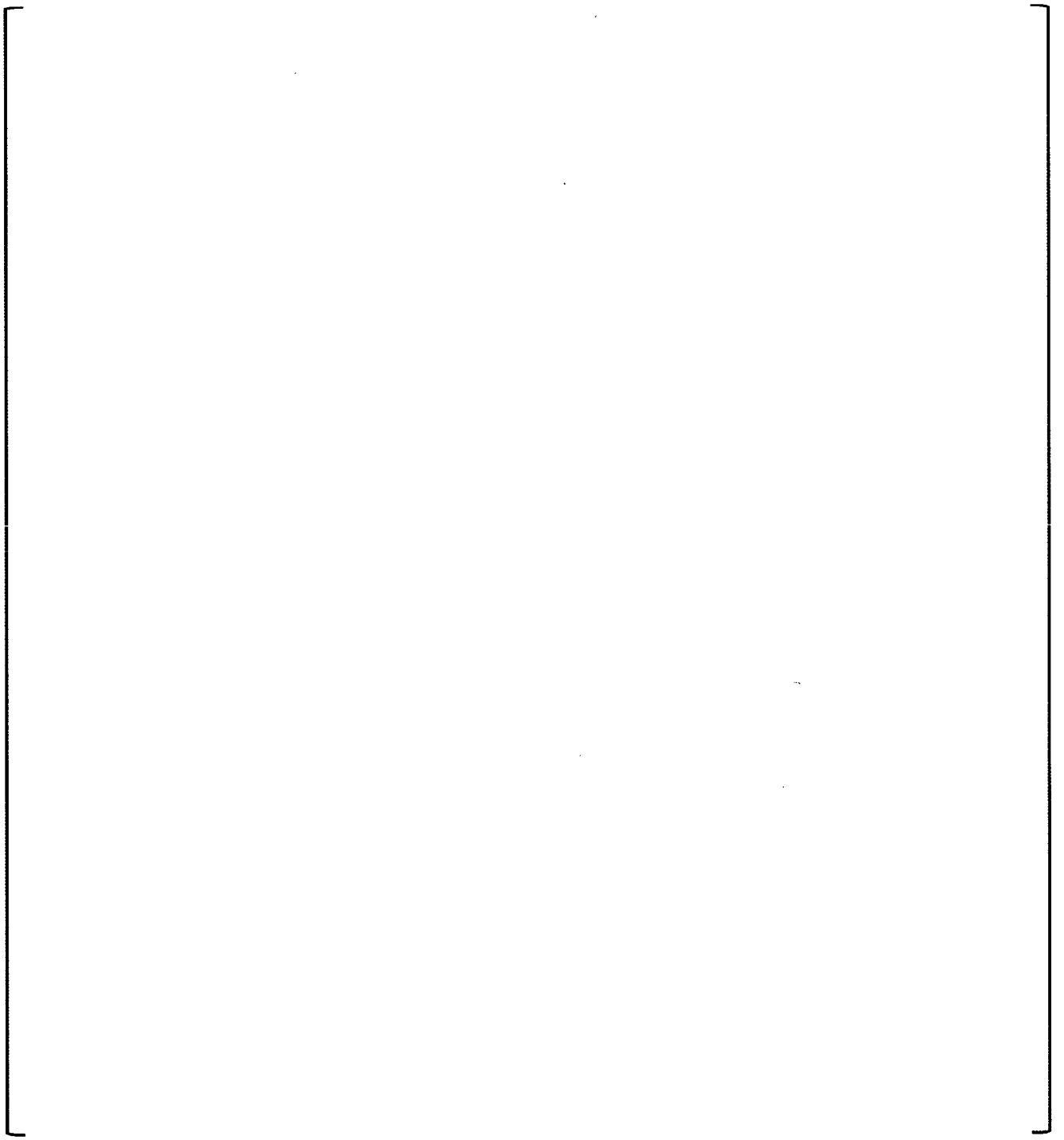
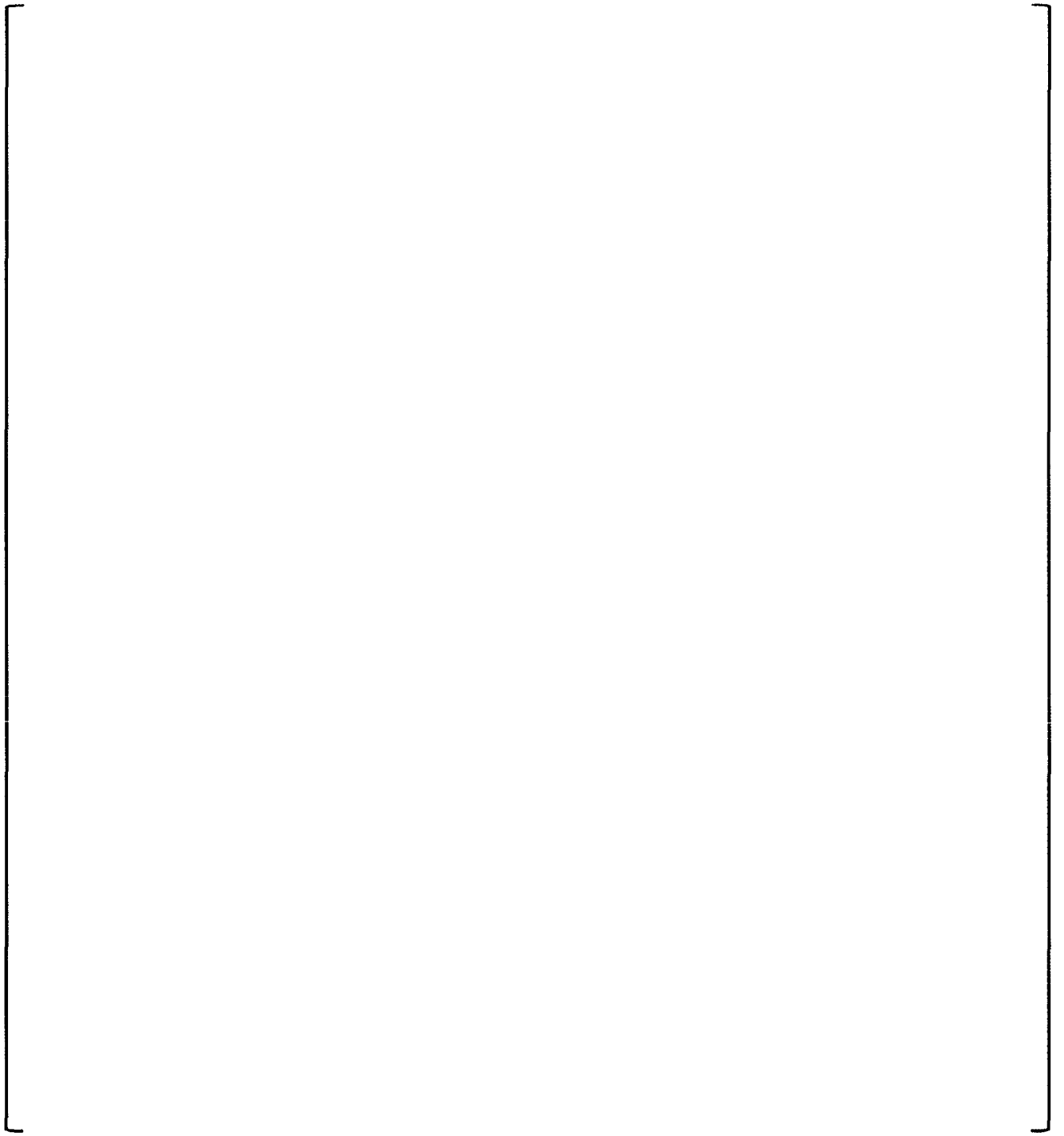
4) Differences in damping ratio:

Figure 1 shows the overall effect of these differences in input parameters and methodology by comparing 100% power in-plane stability ratios calculated by MHI and Westinghouse for nine representative tube locations, considering the number of ineffective AVB supports to be the study parameter. With fewer than ten ineffective AVB supports, the two methods show reasonable agreement, both in the values of in-plane stability ratio and in the rate of change in in-plane stability ratio with increasing number of ineffective AVB supports. MHI results are consistently conservative compared to Westinghouse results in this range. However, for twelve ineffective AVB supports, Westinghouse in-plane stability ratios for tubes above Row 100 are higher than MHI in-plane stability ratios.

Figure 2 compares MHI and Westinghouse in-plane stability ratios at 70% power. With fewer than eight ineffective AVB supports, the two methods continue to agree. The same divergence at higher numbers of ineffective AVB supports observed at 100% power is also present at 70% power, affecting the in-plane stability ratios with greater than eight ineffective AVB supports.



The following table compares the Westinghouse and MHI in-plane stability ratios for the [ ] tubes in Unit 2 with this support condition. The MHI in-plane stability ratios for these support conditions are higher than the Westinghouse in-plane stability ratios. Figures 1 and 2 demonstrate that in-plane stability ratios for all remaining Unit 2 tubes, which have fewer than eight ineffective AVB supports, follow a similar pattern.

Over the range of actual AVB support conditions present in Unit 2 steam generators, in-plane stability ratios calculated by Westinghouse agree with those calculated by MHI.

Tube Location	SG	Number of Ineffective AVB Supports	In-plane Stability Ratio at 70% Power	
			Westinghouse	MHI