VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

January 22, 1980

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
Attn: Mr. O. D. Parr, Chief
Light Water Reactors Branch No. 3
Division of Project Management
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Serial Nos. 756A/090779
1162/121879

FR/MLB
LQA/EGS: SHS
Docket Nos. 50-339

Dear Mr. Denton:

FUEL ASSEMBLY GUIDE TUBE THIMBLE WEAR
Non Proprietary Version

In response to Mr. Parr's letters of September 7, 1979 and December 18, 1979, which requested additional information on the generic Westinghouse modeling of fuel assembly guide tube wear, we are providing information in Attachments 1 and 2 (proprietary and non-proprietary versions, respectively) that has been developed by Westinghouse. These responses, and the details of the Westinghouse model, were discussed with the NRC Staff on October 12, 1979. The responses, and the generic Westinghouse modeling of guide tube wear have been reviewed by Vepco and concluded to be applicable to North Anna Unit No. 2.

Please note that in our response to Question 4, we have committed to providing additional surveillance data to confirm the predictions made with the Westinghouse guide tube wear model. However, the exact mechanism for providing the surveillance data is still being decided. There is the possibility that the data will be provided through a cooperative utility owner's group. We will formally advise you of the exact mechanism as soon as possible.

We concur with the conclusion in Mr. Parr's letter of December 18, 1979, that this matter is resolved for Cycle 1 of North Anna Unit 2. Further, we believe that this conclusion will remain valid through Cycle 2, since our current fuel management plans do not result in any fuel assembly experiencing more than one cycle of residence under a fully withdrawn control rod until Cycle 3.

As this submittal contains information proprietary to Westinghouse Electric Corporation, it is supported by an affidavit signed by Westinghouse, the owner of the information (see Attachment 3). 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 Section 2.790 of the Commission's regulations.

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Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.790 of the Commission's regulations. Correspondence with respect to the proprietary aspects of this application for withholding or the supporting Westinghouse affidavit should reference CAW-79-40, and should be addressed to R. A. Wiesemann, Manager, Regulatory and Legislative Affairs, Westinghouse Electric Corporation, P. O. Box 355, Pittsburgh, PA 15230.

Please contact us should you require additional information or clarification.

Very truly yours,

C. M. Stallings
Vice President-Power Supply
and Production Operations

Attachments:
As indicated

ATTACHMENT 2

NON-PROPRIETARY VERSION

QUESTION 1

Please provide the basis and derivation of the guide thimble wear model described in Reference 1. In particular, explain assumption 4 and the equations provided under assumption 7. Does the model predict maximum local wear or average circumferential wear?

RESPONSE 1

Consider the interface between the guide tube, the control rod assembly and the fuel assembly, shown in Figure 1. Each absorber rodlet is guided in the upper internals by the guide tube, and in the core by the fuel assembly guide thimble tube.

The rodlet is clamped against the guide tube by the coolant pressure, as illustrated in Figure 2. The length of the clamped portion depends on the coolant pressure Δp and the alignment of the guide tube with the fuel assembly. The rodlet bottom tip is pinned in the fuel assembly guide thimble tube.

As illustrated in Figure 2, a certain portion of the absorber rodlet, with a length "L", is unsupported. As shown in Figure 3, [[a,c]

.] The corresponding [a,c] vibration of the cylindrical rodlet results in the oscillation of the pinned rodlet tip, with a maximum angle of rotation θ. The amplitude of wear motion is a function of this angle, as shown in Figure 4.

The maximum angle of rotation θ is [1, 2]

$$\theta = 5.72\, Q^{1/2}\, \phi(x_F)\, f\, \frac{F_L}{LK}$$

where:

- Q is the magnification factor
- ϕ is the fundamental clamped-pinned mode shape
- x_F is the abscissa of the dynamic lift force
- f is the fraction of F_L at rod frequency
- F_L is the dynamic lift force
- L is the unsupported length
- K is the rodlet dynamic stiffness

The total travel of the rodlet tip, in contact with the guide thimble tube inner surface, is:

$$T = 2\, \theta\, D_o\, f_n\, t$$

where:

- D_o is the rodlet diameter
- f_n is the rodlet natural frequency
- t is the total vibration time; this is the total time during which the rodlet is parked in a given axial position.

Finally, the wear volume associated with this travel is

$$V = F.T.W.$$

where:

F is the lateral contact force between the rodlet tip and the thimble tube

W is the wear coefficient

In order to convert the wear volume into a wear depth, consider a typical wear scar in Figure 5; from the observations of wear scar geometries, the wear depth W_D can be determined from

[ ] and $V = \int_0^{L_W} W_A.dL$ [a,c]

where:

W_A is the wear area

L_W is the axial length of the wear scar

Figure 6 represents a wear scar as measured in a thimble tube and confirms the illustration of Figure 5.

The above equations relate the maximum local wear depth W_D to the parameters affecting the rodlet vibration: geometries, flow, stiffness and the wear phenomenon: contact force, time, wear coefficient.

References:

[1] Y. C. Fung "Fluctuating lift and drag acting on a cylinder in a flow at supercritical Reynolds numbers", Jnl. aerospace science, vol. 27, No. 11, November, 1960.

[2] W. T. Thomson, "Vibration theory and applications", 1965, Prentice-hall, eg. 10.7-14 Appendix C.

Question 2

Using the guide thimble wear model, Westinghouse has predicted maximum stresses and stress intensity limits for worn guide thimble walls in two fuel assembly designs, which were subjected to a 6g handling load. These calculated values are listed in Table 4.1 of Reference 1. We note that the stress intensity limits increase as a function of time for both fuel assembly designs and that the limits always remain greater than the maximum stresses, which increase as the wall is worn away. From the supporting discussion preceeding Table 4.1, it is not clear if the stress intensity limits are time dependent. Such an assumption would explain the noted increase in stress limits, but does not address the decreasing material toughness, associated with irradiation hardening. If such credit is being used, it is contrary to the previous Westinghouse position in Reference 2 and item 4.0.5 of Reference 1. Please clarify whether or not Westinghouse has taken credit for irradiation strengthening. Show that the criteria adopted represents the more conservative approach.

RESPONSE 2

The accelerations and resulting loads applied to a fuel assembly during handling operations are non-operational loads, as opposed to conditions 1, 2, 3 and 4 induced loads.

In analyzing the non-operational loads, credit is taken for the increase of the yield and ultimate strength with irradiation.

On the other hand, the fracture analysis is performed to address the decreasing material toughness. As you mention, the material toughness, characterized by the critical stress intensity factor, should be a decreasing function of irradiation and therefore of time. The critical stress intensity factor of 25,000 psi $\sqrt{in}$ is the maximum experimental value from tests on 400 ppm hydrogen charged annealed zircaloy 2 after irradiation to 2.5×10^{20} n/cm^2, $E > 1$ MeV. [1]

This minimum value, applicable to 250 week results, has conservatively been applied to 25 week results in Table 4.1 of our report NS-TMA-2102.

[a,c]

In addition, the postulated crack in a thimble tube, [ ], will be in a state of plane stress and thereby will develop higher toughness. The 25,000 psi $\sqrt{in}$ in Table 4.1 of NS-TMA-2102, which corresponds to plane strain test results, represents a lower bound toughness.

In summary, credit is taken for irradiation hardening when Sy and Su are considered for non-operational loading conditions. The minimum fracture toughness is conservatively used, regardless of irradiation; this experimental value, derived from plane strain tests, is conservatively applied to plane stress conditions.

In addition, a 6g handling load has been assumed. This load is significantly higher than the actual load actually imposed on the fuel during handling operations. No credit is taken for the uneven load distribution in the thimbles which results in load transfer when yielding is reached. Finally the yield strength value used represents a lower bound as indicated in Response to Question 8.

Reference

1. R. G. Hoagland and R. G. Rowe, "Fracture of irradiated Zircaloy 2", Journal of Nuclear Materials 30 (1969), p. 179 - 195.

QUESTION 3

Guide thimble wear data, which were taken from Point Beach Units 1 and 2 spent fuel, are discussed, listed, and plotted in Section 2.3, Table 2.1, and Figure 5, respectively, of Reference 1. Please confirm that the time units in Section 2.3 and Table 2.1 are in error and make corrections as needed. Should not the units be days instead of hours?

RESPONSE 3

The time units in Section 2.3 and Table 2.1 are in error. The units should be days instead of hours.

QUESTION 4

Submitted Westinghouse information does not explain why the guide thimble wear model, which was developed from measurements taken on two 2-loop plants with 14 x 14 fuel assemblies, is applicable to wear predictions on plants of other designs. Other NSSS-vendor-designed plants have experienced a "plant-specific" and "core-position" dependence in the observed wear. Therefore, please explain how the model accounts for wear differences and provide supporting data for all Westinghouse design variations. If the analytical treatment of design variations are justified, the supporting data can be provided in a confirmatory manner after NRC approval of the model. Please provide details of your data-gathering proposal, a schedule for its implementation, and state your commitment to carry out this confirmatory program. This data-gathering program should be completed expeditiously considering the availability of irradiated assemblies in all Westinghouse plants.

RESPONSE 4

The guide thimble wear results obtained from Point Beach Units 1 and 2 presented in Table 2.1 of our report NS-TMA-2102, were statistically evaluated to identify a possible core location effect on the wear depth. The core location relative to the reactor vessel inlet and outlet nozzles is of particular interest. The analysis of the data shows [

.]

The plant specific effect results from differences in mechanical and hydraulic characteristics. These differences are accounted for in the wear model discussed in response to Question 1. The various parameters affecting the wear depth Wo change as the fuel assembly design, the control rod assembly, the reactor internals or the flow change. This explains the different results predicted for 14 x 14 wear depth as compared to 17 x 17, and split tube guidance as compared to sheath guidance.

Report NS-TMA-2102 and the response to question 1 present the analytical treatment of design variables such as geometries and flow, and their impact on the wear predictions.

The safety analysis, performed according to standard SAR requirements, shows adequate safety margins even in the extreme case of worn-through guide thimble tubes. This analysis, the measurements performed at Point Beach Units 1 and 2 and extensive trouble free experience provides substantial evidence that guide thimble wear is not a safety concern in Westinghouse plants.

In response to the NRC request, we are committed to providing additional surveillance data. However, the exact mechanism for providing these surveillance data is still being decided, and may be in the form of a cooperative utility owners' group. We will formally advise you on the specifics of our surveillance program, and the schedule for its implementation, as soon as possible.

QUESTION 5

In Reference 3, Westinghouse stated that the effect of hydrogen content on the mechanical properties of Zircaloy is discussed in WCAP-9179 (Reference 4). We have reviewed that topical report and found no information on this issue. Please provide your evaluation of how this consideration affects the safety analysis. Include in this evaluation a description of the propensity for hydrogen uptake of the Zircaloy as a function of the accumulative wear.

RESPONSE 5

Hydrogen measurements on a thimble tube exposed in WEP Point Beach Unit 1 for one cycle were [ ] [a,c]
Maximum pre-irradiation hydrogen content was [ ]. At one location in a bulge [a,c]
joint the hydrogen concentration, observed metallographically, [[a,c]
]. The hydrogen concentration was estimated at [[a,c]
compared to the maximum measured value of [ ]. [[a,c]
]. [a,c]

At the Westinghouse Research Laboratories in Pittsburgh, fretting tests were performed in a water filled autoclave with cold worked and stress-relieved annealed Zircaloy-4 tubing, [ ] and small blocks [a,c] of 304 stainless steel. These tests were conducted for four days in 600°F water containing 1500 ppm boron and maintained at a PH of ~ 6.1 through use of LiOH. The measured hydrogen content in the water was 42.33 cc per Kg H_2O. The results [a,c]
of this test showed that [[a,c]
].

Earlier investigations into the effects of hydride platelets on the fracture toughness of Zircaloy-2 were conducted at Battelle Northwest Laboratories. Rolled plate material, of reactor grade Zircaloy-2 (1.44% Sn, 0.118% Fe, .092% Co, .036% Nu) were additionally cold worked by rolling to levels of 0, 20 and 40% reduction in thickness and annealed at 750°C for one hour. A number of annealed specimens (grain size of .035 to 0.40 mm) were charged with hydrogen to levels of 100 and 400 ppm at 460°C. Metallographic examination revealed the formation of uniform hydride distribution. Under irradiated conditions of 2.5×10^{20} n/cm^2 ($E \geq 1$ Mev) and 400 ppm concentration level, a minimum toughness of K_{Ic} = 25KSI $\sqrt{in.}$ was obtained between 0 - 20°C. In addition, at higher test temperatures, the toughness increased, and no sub-critical cracking was observed above 120°F.

Therefore, [ ] in the [a,c]
Westinghouse to NRC response. The critical stress intensity factor, 25 Ksi $\sqrt{in.}$ used in Table 4.1 of the analysis was appropriate for safety analysis of thimble wear.

QUESTION 6

When Eddy current testing was conducted on worn guide thimble tubes from the Point Beach Units, did the presence of zirconium hydrides affect the results? How sensitive is the interpretation of eddy current signals to hydride presence? How is this effect taken into account?

RESPONSE 6

Eddy current measurements that were taken at the Point Beach spent fuel pit are
[ ].[a,c]
The effect of these components is to increase the resistivity of the Zirconium 4 [a,c]
[[a,c]
]

The wear depth was obtained as the difference between the signal in the unworn [a,c]
zone minus the signal in the worn zone. [[a,c]
]. The worn zone being [[a,c]
]. This results in an apparent thimble tube thinning in the worn section.

No attempt has been made to include this effect in the data evaluation due to its conservative nature.

QUESTION 7

References 1, 3, and 5 do not address the consequences of hole formation in worn guide thimble tubes. Moreover, it is not clear from the submitted information if Westinghouse (1) has observed holes during inspection of the 49 guide thimble tubes that were examined in the Point Beach spent fuel, or (2) has predicted (with the guide thimble wear model) hole formation to occur during projected fuel life-time. Please clarify. Also, if holes have been observed or are anticipated, provide a discussion on the impact of such holes on guide thimble tube integrity, control rod motion, and thermal-hydraulic performance. This discussion should also account for flow-induced vibration resulting in crack propagation and possibly fatigue fracture in locally thinned areas of the thimble wall. This discussion should address the integrity of the thimble tubes during the entire core residence time; both during periods of wear (under RCCA) and when the fuel assemblies are not under RCCAs.

RESPONSE 7

Westinghouse has not observed holes during inspection of the 49 guide thimble tubes that were examined in the Point Beach spent fuel.

The predictions of the guide thimble wear model are presented in Figure 5 of our [a,c]
report NS-TMA-2102. They represent a [ ]. At [[a,c]
]. All the curves are [ ]. [[a,c]
[a,c]
]. [a,c]

The flow induced vibration of the fuel assembly will result in cyclic stresses in
the guide thimble tubes. At the wear scar location, between the two top grids, [a,c]
the maximum stresses are originated from the [ ], the amplitude [a,c]
of vibration [ ]. The analysis of the vibration of a worn-through thimble tube shows that
the peak to peak stress, at the wear scar, is [ ] which is below the fatigue [a,c]
curve shown in Figure 7. A [ ] vibration amplitude was conservatively assumed. [a,c]

The thermal hydraulic impact of a worn-through thimble tube was investigated. The
increase in core bypass flow, which results from a hole in the thimble tube, was [a,c]
calculated to be [ ]. At least [ ] would have to be worn through in [a,c]
order to increase the core bypass flow by [[a,c]
] this effect in insignificant. [a,c]

The worn cross section is located above the absorber rodlet bottom end plug cone, which guides the rodlet and, therefore, does not jeopardize the movement of the control rod assembly.

The impact of such a hole on guide tube integrity is provided in our report NS-TMA-2102.

QUESTION 8

During the review of WCAP-9179 (Reference 6), the staff questioned the Westinghouse value for the ultimate tensile strength of Zircaloy components. The subsequent Westinghouse response (Reference 2) stated that the ultimate tensile strength of Zircaloy was not used in the design analyses of present fuel assembly designs. However, the analysis contained in Reference 1 uses the ultimate strength as a limiting variable. Therefore, please submit for review the Westinghouse correlation for the ultimate tensile strength of Zircaloy.

RESPONSE 8

Unirradiated values for .2% yield strength and ultimate strength used were lower bound values as indicated below:

Yield Strength [ ] [a,c]

$0 \leq T°F \leq 600°F$

Ultimate Strength [ ] [a,c]

$0 \leq T°F \leq 600°F$

Irradiated values of .2% yield strength used were lower bound values indicated below:

Yield Strength [ ] [a,c]

$0 \leq T°F \leq 600°F$ nvt > [illegible]$\times 10^{20}$ ([illegible])

Because of the limited uniform elongation present in irradiated annealed Zircaloy-4, the [ ] [a,c] [a,c]

The values for ultimate strength of Zircaloy-4 are used for failure analysis to determine both failure mode and margin available for particular components. Original design and analysis is based on the yield strength for Zircaloy-4.

QUESTION 9

Section 4.1 of Reference 1 states that the stress intensity factors are plotted as a function of time for 14x14 and 17x17 fuel assemblies in Figure 5. This is not true. Please provide such a figure or amend Figure 5 as necessary.

RESPONSE 9

The stress intensity factors are plotted as a function of time for 14x14 and 17x17 fuel assemblies in Figure 6 of our report NS-TMA-2102.

QUESTION 10

Per item 4, Section 4.0 of Reference 1, your analyses are based on uniform wear in all thimble tubes. Address the margin of conservatism for this assumption. Compare your results with analysis that considers non-uniform wear resulting in a shift of the neutral axis. Note that such shifts will result in both direct stress and bending stresses.

RESPONSE 10

Assumption 4 of Section 4.0 states that wear is assumed to occur uniformly in all thimble tubes. This means that, for a given fuel assembly, the wear predicted to occur in a thimble tube under a split tube, or sheath, location is the same for all thimble tubes under a split tube, or sheath, in this fuel assembly. Point Beach measurements show wear results that vary, within the same fuel assembly, from thimble to thimble. The wear model presented in NS-TMA-2102 does not take credit for this observation: the maximum predicted local wear is applied to all thimble tubes under a split tube, or sheath , in a given fuel assembly.

As discussed in the response to Question 1, the model does predict maximum local wear, and our analyses do take into consideration the shift of the neutral axis a d the resulting direct and bending stresses.

QUESTION 11

For Condition 1 and 2 load analyses of Reference 1, a skew factor is mentioned that accounts for the uneven axial load distribution. Clarify how the skew factor is related to both geometric changes (resulting from uneven wear) and assembly misalignment. How does the skew factor impact the load analyses?

RESPONSE 11

During fuel assembly mechanical testing, strain gages were mounted on thimble tubes to measure thimble loads as a function of thimble location in the fuel assembly. The measurements showed that, [[a,c]
[a,c]
] [[a,c]
] [[a,c]
.] It was conservatively assumed that all thimble tubes under a split tube location have the same load as the tube with the maximum load, in a split tube location. Similarly, all thimble tubes under a sheath location have the same load as the tube with the maximum load on a sheath location. In addition, [[a,c]
[a,c]
] This is due to the fact that the grids distribute [a,c] the loads over thimbles and fuel rods. The skew factors used correspond to the top span although the stress analysis is done one span below, were the wear scar is located. This tends to overestimate the skew factors and, therefore, the load on the thimbles.

QUESTION 12

The equation for the wear volume in Reference 1 appears linear with time. However, in Figures 5 and 6, wear depth is plotted versus time, and the resulting correlation appears to be non-linear. Please provide information on how these parameters are related.

RESPONSE 12

The non-linearity of the wear depth versus time relationship is discussed in the Response to Question 1. It results from [ ] [a,c] , [a,c]

QUESTION 13

For Condition 3 and 4 load analyses, described in Reference 1, it is stated that the stresses in a worn guide thimble tube are based on generic stress calculations. Please reference where these generic stress calculations can be found. It is also stated that the stresses in the unworn guide thimble tubes are increased to account for the reduction of the tube cross-section due to the wear scar. This would indicate credit for a load redistribution to the unworn guide thimble tubes. Is a skew factor employed in the Condition 3 and 4 load analyses? Describe the state of stress in the worn guide tubes and how the uneven wear affects the load-bearing characteristics of the worn tubes.

RESPONSE 13

The Condition 3 and 4 load analysis for the worn thimble tubes was based on generic seismic plus LOCA event thimble stress values, [ ] [a,c], from WCAP 8236, Addendum 1. These stresses [a,c] are calculated using finite elements core models as described in WCAP 8236.

The stresses calculated in WCAP 8236 Addendum 1 are stresses in an unworn guide thimble tube. The existence of a wear scar and the resulting tube cross-section reduction and neutral axis shift are taken into account in the wear analysis. For a given thimble tube, the wear results in increased stresses and no credit is taken for load redistribution.

QUESTION 14

Discuss the potential for guide thimble wear in fuel assemblies with core components other than control rod assemblies.

RESPONSE 14

Core components other than the control rod assemblies are: thimble plugs, burnable poisons, and sources. Both the burnable poisons and the sources are "long" rodlets that are inserted down to the dashpot, while the thimble plug is a short rodlet. These core components, when inserted in the fuel assembly, rest on the top nozzle adapter plate and are not subject to [[a,c]

] This has been confirmed by the observations [a,c]
performed on Point Beach Unit 2 fuel assembly B07, which had a burnable poison assembly during one cycle of operation, [[a,c]
] [a,c]

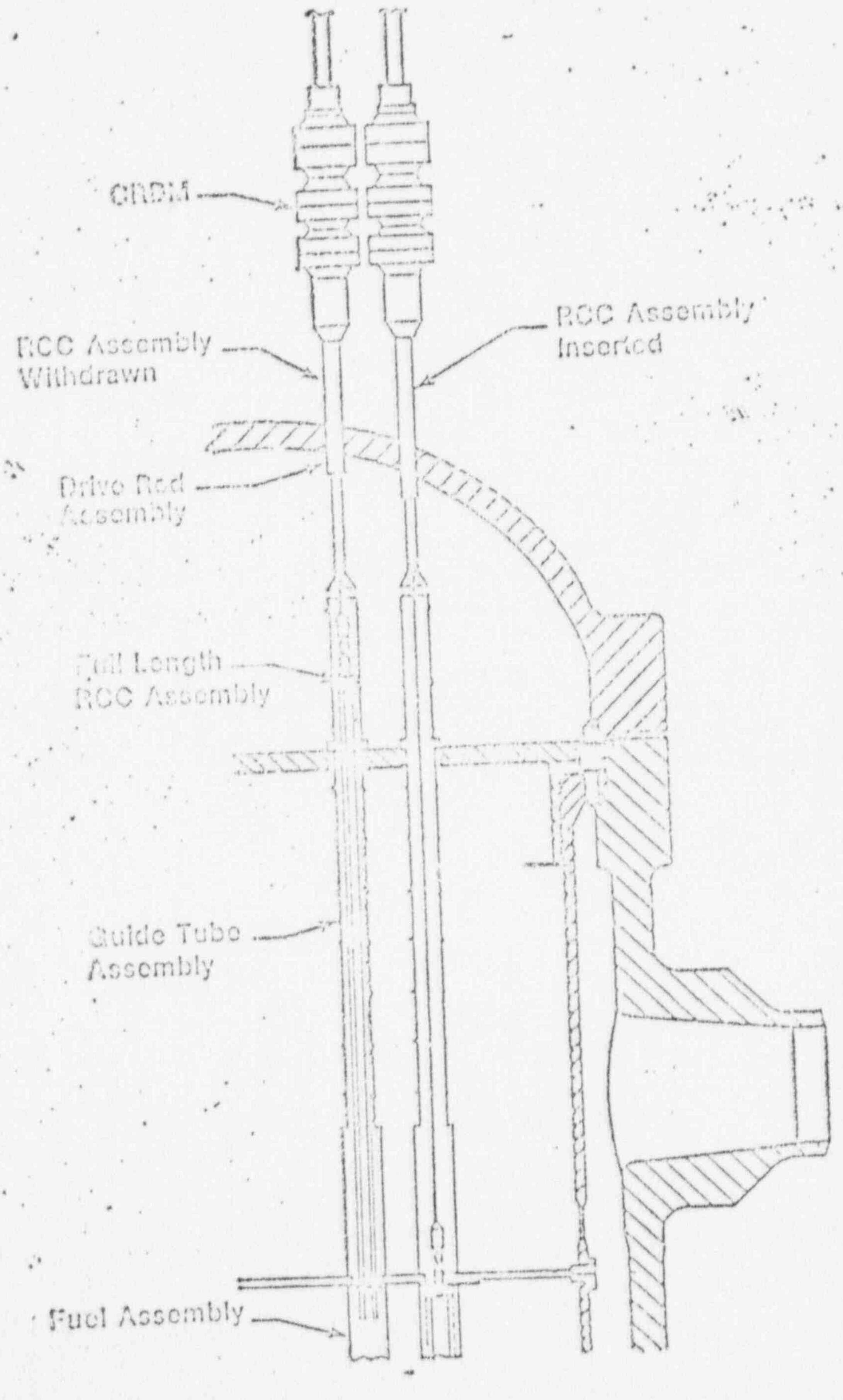

FIGURE 3. DRIVELINE OVERVIEW

[a,c]

FIGURE 2 FORCES EXERTED ON THE ABSORBER RODLET

[a, c]

FIGURE 3 CROSS FLOW IN THE FUEL ASSEMBLY TOP NOZZLE

[a,c]

FIGURE 4 DYNAMIC LIFT FORCE RESULTING FROM CROSS FLOW IN THE FUEL ASSEMBLY TOP NOZZLE

[a,c]

FIGURE 5 TYPICAL WEAR SCAR IN A FUEL ASSEMBLY THIMBLE TUBE

[a,c]

FIGURE 6 MEASURED WALL THICKNESS AS A FUNCTION OF ANGULAR LOCATION OF WEAR

(a,c)

FIG. 7 - FATIGUE CURVE FOR ANNEALED ZIRCALOY-4
SHEET MATERIAL

17x17 THIMBLE LOCATIONS

[a,c]

FIGURE 8 UNEVEN LOAD DISTRIBUTION AND THIMBLE TUBE UPPER SPAN AND DASHPOT SPAN

ATTACHMENT 3

Westinghouse Electric Corporation
Water Reactor Divisions
Nuclear Technology Division
Box 355
Pittsburgh Pennsylvania 15230

November 7, 1979
CAW-79-40

Mr. H. R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

APPLICATION FOR WITHHOLDING PROPRIETARY

INFORMATION FROM PUBLIC DISCLOSURE

SUBJECT: Diablo Canyon, Units 1 and 2 (Docket Numbers 50-275 and 50-323)
McGuire, Units 1 and 2 (Docket Numbers 50-369 and 50-370)
North Anna, Unit 2 (Docket Number 50-339)
Salem, Unit 2 (Docket Number 50-311
Sequoyah, Units 1 and 2 (Docket Numbers 50-327 and 50-328)

Responses to NRC Questions on Guide Tube Thimble Wear

Letter from Utility to Denton

Gentlemen:

This application for withholding is submitted by Westinghouse Electric Corporation pursuant to the provisions of paragraph (b)(1) of 10CFR Section 2.790 of the Commission's Regulations.

The accompanying affidavit identifies the information sought to be withheld from public disclosure, 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 Section 2.790 of the Commission's regulations.

The undersigned has reviewed the information sought to be withheld and is authorized to apply for its withholding on behalf of Westinghouse, WRD, notification of which was sent to the Secretary of the Commission on April 19, 1976.

It is requested, therefore, that the Westinghouse proprietary information being transmitted by the involved utility letter referenced above be withheld from public disclosure in accordance with the provisions of 10CFR Section 2.790 of the Commission's regulations.

Correspondence with respect to the proprietary aspects of this application for withholding or the accompanying affidavit should reference CAW-79-40 and should be addressed to the undersigned.

Very truly yours,

Robert A. Wiesemann

Robert A. Wiesemann, Manager
Regulatory & Legislative Affairs

/bek
Attachment

cc: J. A. Cooke, Esq.
Office of the Executive Legal Director

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared Robert A. Wiesemann, 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 Corporation ("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:

Robert A. Wiesemann, Manager
Regulatory & Legislative Affairs

Sworn to and subscribed
before me this 7 day
of November 1979.

Notary Public

[illegible]

(1) I am Manager, Regulatory and Legislative Affairs, in the Nuclear Technology Division, of Westinghouse Electric Corporation 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 or rulemaking proceedings, and am authorized to apply for its withholding on behalf of the Westinghouse Water Reactor Divisions.

(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 Westinghouse Nuclear Energy Systems 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.

In determining whether information in a document or report is proprietary, the following criteria and standards are utilized in Westinghouse. Information is proprietary if any one of the following are met:

(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 of 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.

(g) It is not the property of Westinghouse, but must be treated as proprietary by Westinghouse according to agreements with the owner.

(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 is not available in public sources to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld in this submittal are the responses to NRC questions related to guide tube thimble wear directed to applicants for operating licenses for Diablo Canyon Units 1 and 2, McGuire Units 1 and 2, North Anna Unit 2, Salem Unit 2, and Sequoyah Units 1 and 2.

Public disclosure of this information is likely to cause substantial harm to the competitive position of Westinghouse as it would reveal the basis of the Westinghouse fuel assembly design for the designated plants and similar plants, which is recognized by the Staff to be of competitive value and because of the large amount of effort and money expended by Westinghouse in development of this design.

This information is valuable to Westinghouse because:

(a) Information resulting from this design gives Westinghouse a competitive advantage over its competitors. It is therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information which 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.

This information enables Westinghouse to:

(a) Justify the design basis for the fuel

(b) Assist its customers to obtain licenses

(c) Meet warranties

Further, this information has substantial commercial value as follows:

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

(b) Westinghouse uses the information to perform and justify analyses which are sold to customers.

(c) Westinghouse uses the information to sell nuclear fuel and related services to its customers.

Public disclosure of this information is likely to cause substantial harm to the competitive position of Westinghouse in selling nuclear fuel and related services.

Competitors could obtain the equivalent information, with difficulty, by investing similar sums of money and provided they had the appropriate resources available and the requisite experience.

Further the deponent sayeth not.