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SUBJECT:
RESPONSE TO NRC LTR DTD 07/20/78...FORWARDING INFO RE THE INTEGRITY OF CONTROL ROD GUIDE TUBE FACILITIES USING EXXON NUC-SUPPLIED FUEL.

PLANT NAME: RE GINNA -- UNIT 1
H B ROBINSON -- UNIT 2
PRAIRIE ISLAND - UNIT 1
FT CALHOUN #1

REVIEWER INITIAL: XJM
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B. Grimes
M. CONNER

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EXXON NUCLEAR COMPANY, Inc.

2101 Horn Rapids Road
P. O. Box 130, Richland, Washington 99352
Phone: (509) 943-8100 Telex: 32-6353

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September 15, 1978

Mr. Brian K. Grimes, Assistant Director
for Engineering & Projects
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Grimes:

In your letter dated July 20, 1978, you requested that Exxon Nuclear Company provide information regarding the integrity of control rod guide tube facilities using Exxon Nuclear-supplied fuel. The attached information is provided in response to your request.

Sincerely,

G. F. Owsley, Manager
Reload Licensing

GFO:gf
Attachment
As noted

A001 S/1 ADD LIST

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

INTEGRITY OF CONTROL ROD GUIDE TUBE (CRGT)

FACILITIES USING EXXON FUEL

Exxon Nuclear fuel of the Rod Cluster Control (RCC) type resides in the following domestic reactors:

H. B. Robinson 2

D. C. Cook 1

R. E. Ginna

These are all plants designed by Westinghouse. We are unaware of any Westinghouse plants which have a significant guide tube wear problem. Exxon Nuclear fuel in the reactor is essentially the same in geometry as the Westinghouse fuel so we do not expect any significant wear to appear in the guide tube. However, inspections are planned at the earliest opportunity.

ENC RCC type assemblies will be introduced in the following plants during 1979 and 1980:

Kewaunee

Prairie Island 1 & 2

Maine Yankee

Ft. Calhoun

These are also plants designed by Westinghouse except for Maine Yankee and Ft. Calhoun which are Combustion Engineering designs.

Specific responses the NRC requests for information are given below:

1. *Describe the details of any routine surveillance of fuel assemblies performed at facilities using your fuel.*

   There has been no surveillance of the inside of guide tubes of ENC fuel.

2. *Have examinations of the fuel assembly guide tubes to detect wear been completed at any facility using your fuel? If so, provide the following information:*

   a. *The method of examination (i.e., destructive testing, eddy-current testing, periscope, borescope, mechanical gage, TV, etc.)*

   b. *The areas of CRGT examined.*

   c. *Qualification of the examination procedure.*

   d. *The number of CRGT sampled at each facility and the applicable operational parameters including: the core location; EFPH; time in service; related control rod parameters; fluence; etc.*

   e. *Results of observations or measurements.*

   There has been limited visual examination of another vendors fuel at H. B. Robinson 2. Although no obvious wear was noted there is insufficient information to establish the absence of significant wear.

3. *Were any CRGT destructively tested (e.g., by mechanical or metallographic means) and what observations or measurements were made?*

   No observations of any type have been made for ENC fuel.

4. *What correlations were suggested between operating parameters and CRGT condition?*

   This cannot be addressed until appropriate fuel inspections have been made.

5. *If specific examinations for CRGT wear have not been completed at any facility, either provide other evidence for the absence of wear or answer the following:*

a. *Are examinations planned?* Yes. *If so, provide details as requested in 2 a-d.*

Examinations are planned at H. B. Robinson during the early 1979 outage. The examination will consist of borescopic inspection of the guide tube in 4 ENC fuel assemblies which have undergone 3 cycles of operation.

b. *Have out-of-pile wear tests been completed? If so, provide details including qualification of the test procedure and answers to 2 a-d. Address vibration, fatigue, flow visualization, etc.*

Out-of-pile tests for CE type fuel assemblies are planned in the next several months. Instrumentation will be provided to measure vibration amplitude. Destructive and non-destructive examinations of critical components will be made after completion of tests at reactor conditions of temperature pressure and flow.

6. *Document any other observations of wear of degradation found in the examination of your fuel assemblies (i.e., grid wear, post wear, etc.). Provide the results of your assessment of the consequence of these observations. Describe any design changes effected to either mitigate the consequences of this wear or eliminate the wear.*

No significant wear has been observed on any ENC fuel components.

7. *If CRGT wear has been found at facilities using your fuel:*

Significant wear has been found in another vendors fuel in Maine Yankee.

a. *What have been the attributive causes?*

b. *Have correlations been made to characterize the phenomena with respect to operating procedures and plant specific core parameters?*

c. *Are specific locations within the core or particular CRGT within an assembly more susceptible?*

It is not appropriate for ENC to respond relative to another vendor's fuel. We are aware of the applicable information made available to the public.

8. *If CRGT wear has been observed at any facility using your fuel:*

   a. *Describe your efforts to reassess the mechanical integrity of the core with worn CRGT to demonstrate that coolability and scramability exist for the normal, seismic and anticipated operational occurrence loading conditions. Describe the worst condition analyzed.*

   b. *Discuss your structural design bases. Indicate if provisions have been made to accommodate wear in the design. What amount of wear or related degradation would be cause for rejection for reload? Provide the allowable stresses used in the structural analysis. Discuss the effects of temperature strain rate, notch severity, irradiation and hydrogen content on mechanical properties used to establish the allowable stresses.*

   c. *Provide the results of your structural analysis summarizing the CRGT loads and the primary and secondary stress intensities for normal, fuel handling, and accident loading conditions.*

   d. *Discuss the effects of CRGT wear on the thermal-hydraulic performance of the reactor under normal and accident conditions.*

9. *Discuss any control rod scram testing that has been completed to demonstrate scramability in worn CRGT. Address the effects of worn CRGT on scramability for the worst expected guide tube geometry. Include the strain-deflection limits for control rod functionability.*

10. *If examinations for CRGT wear have not been or will not be made at representative facilities using your fuel, provide justification for continued operation of these facilities.*

No wear has been observed in facilities in which ENC fuel now resides. If planned inspection of ENC fuel at H. B. Robinson reveals significant wear, ENC fuel in R. E. Ginna and D. C. Cook will be inspected and definitive responses will be prepared for questions 6 thru 10.

On completion of the out-of-pile tests on CE type fuel assemblies ENC will provide information to the NRC staff concerning the results and other appropriate information.