## EXON NUCLEAR COMPANY, INC.

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GNW:083:86 July 16, 1986

Mr. Garl H. Berlinger, Chief Reactor System Branch Division of PWR Licensing - A Nuclear Regulatory Commission Washington, D.C. 20555

Reference: Letter from C.H. Berlinger (NRC) to G.N. Ward (ENC) dated June 19, 1986.

Dear Mr. Berlinger:

Subject: Summary of Exxon Nuclear Fuel Performance

The attachment provides a summary of Exxon Nuclear's fuel performance through December 1985 as requested by the reference letter.

Prior to publication of the <u>Fuel Performance Annual Report for 1985</u> by the NRC, Exxon Nuclear would appreciate the opportunity to review the section of the prepublication version pertaining to Exxon Nuclear's fuel.

If there are any questions, please contact me.

Sincerely,

G.N. Ward, Manager Reload Licensing

cc: Shih Liang Wu (w/Attachment)

Attachment

GNW/tmrc

8711030352 871102 PDR FOIA CONNOR87-685 PDR ENC fuel performance through December 1985 is described in Reference 1. As of that time, a total of 8,387 fuel assemblies comprising 1,138,895 fuel rode had been irradiated, with slightly over 50% of these assemblies going to PWRs. Table 1 summarizes the assembly distribution, fuel rod performance, and experience with gadolinia fuel in both BWRs and PWRs at the end of December 1985. Figure 1 highlights the exposure distribution of ENC fuel at that time. Maximum exposure levels in both BWRs and PWRs were reached by fuel in two high burnup programs. Those burnups included batch average exposures of 41,100 MWD/MTU for a group of fuel rods at the Big Rock Point BWR and 47,700 MWD/MTU for fuel irradiated at H.B.Robinson-2. The fuel integrity based on failures that were judged to be from fuel-related or unknown causes was 99.994%. This statistic includes a large group of suspected failures at one PWR reactor which have not yet been confirmed or examined. The operating experience associated with each of the many fuel types fabricated by ENC is outlined in Table 2. Figure 1 highlights the exposure distribution of ENC fuel as of the end of 1985.

1. Summary of Exxon Nuclear Company Fuel Performance for 1985. XN-NF-86-74(NP), Exxon Nuclear Company, Inc., Richland, Washington, 99352, July 1986. Table 1. Summary of Exxon Nuclear Fuel Assembly Distribution, Fuel Rod Performance, and Gadolinia Fuel Experience, as of December 31, 1985

A. Fuel Assemblies

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Reactor	In Core as of	Discharged as	Total
Type	Dec. 31, 1985	of Dec. 31, 1985	
BWR	1,456	2,605	4,061
PWR	1,994	2,332	4,326
Total	4,024	4,937	8,387

B. Fuel Rods

	In Core		Discharged			
Reactor Type	Number of Rods	Peak Rod Burnup MWD/MTU	Number of Rods	Peak Rod Burnup MWD/MTU	Total Number of Rods	Failure Rate, % (a)
BWR PWR	168,214 486,080	34,300 48,300	83,090 401,511	45,100 52,500	251,304 887,591	0.017 0.004
Total	654,294		484,501		1,138,895	0.007

C. Gadolinia Rods

Reactor Type	Number Rods	of Gadolinia Irradiated
8WR PWR		17,107 3,688
Total		20 795

(a) Failures not directly attributable to external causes (e.g., plantrelated causes such as baffle jetting, fretting from the presence of foreign objects or other off-normal core conditions).

Reactor Type	Fuel Type	Total Assemblies Irradiated	Maximum Assy Ave Exposure Achieved (MWD/MTU)	Fuel Rod Integrity'*'
BWR	Non-std BWR( )	972	41.1(*)	99.948%
	8x8 unpress.	12/4	21.3	99,999%
	9x9	8	16.8	100.000%
PWR	14×14	1623	43.9	99.998%
	15×15	1507	47.7	99.995%
	16×16	820	46.2	99.998%
	17×17	376	36.1	100.000%

Table 2. Operating Experience with fuel types fabricated by Exxon Nuclear Company ...

Failures not directly attributable to external causes (e.g., plant-related causes such as baffle jetting, fretting from the presence of foreign objects, or other off-normal core conditions).

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(\*) Includes 6x6, 7x7, and 11x11 designs.

Average of Extended Burnup Demonstration rods.



Figure 1. Distribution of Irradiated ENC Fuel by exposure through the end of 1985.

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## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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