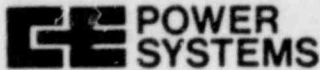


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July 1, 1980
LD-80-039

Mr. Ralph O. Meyer, Leader
Reactor Fuels Section
Core Performance Branch
Division of Systems Safety
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: 1979 Fuel Performance Data

Reference: NRC letter R. O. Meyer to A. E. Scherer, dated April 23, 1980.

Dear Mr. Meyer:

In response to your referenced letter requesting input for your 1979 fuel performance annual report, this letter transmits the requested data. Table 1 identifies the total number of fuel assemblies and fuel rods irradiated and discharged from each Combustion Engineering reactor, except for Arkansas Nuclear One-Unit #2 (ANO-2), by batch and gives the end of the year or discharged burnup. Data for ANO-2 is not included because this unit was not declared commercial until March, 1980.

Five of Combustion Engineering's plants were shutdown for refueling in 1979. In none of these cases did the utility find sipping of the fuel assemblies necessary. We therefore have no direct observations of fuel defects during 1979. For purposes of estimating the fuel performance of the Combustion Engineering plants, we have enclosed a copy of a paper from the ANS Topical meeting on LWR Fuel Performance. This paper relates coolant activities to fuel performance at a time appropriate for the fuel discharged at various plants over the 1979 period.

We hope that these data are of use to you in your efforts to update your report.

Very truly yours,

COMBUSTION ENGINEERING, INC.

A handwritten signature in dark ink, appearing to read 'A. E. Scherer'.

A. E. Scherer
Director
Nuclear Licensing

X601
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1/1

AES:dag

Enclosure

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A handwritten mark in dark ink, resembling a capital letter 'C' or a checkmark.

TABLE 1

SUMMARY OF C-E FUEL IRRADIATED AND/OR DISCHARGED IN 1979

Reactor	Fuel Batch ¹	No. of Assemblies		No. of Fuel Rods		Avg. Batch Burnup (Gwd/Mtu)	
		Irradiated	Discharged	Irradiated	Discharged	@ 12/79	@ Discharge
Calvert Cliffs Unit #1	A	40	40	7040	7040		25.8
	B	1		166		36.9	
	C	32	32	5632	5632		29.5
	D	72		12672		23.1	
	E	72		12672		13.6	
	F	72		12672		3.9	
Calvert Cliffs Unit #2	B	65	64	10660	10496	25.4	26.9
	C	68		11632		24.2	
	D	84		14784		10.2	
	E	64		11264		0.2	
Fort Calhoun Unit #1	D ₀	17		29992		33.3	
	D ₁	4		704		29.6	
	E ₆	16		2816		24.5	
	E ₁	16		2816		27.2	
	F ₀	26		3520		19.2	
	F ₁	16		2816		19.7	
	G	44		7744		8.7	
Maine Yankee	E16	61		9760		29.4	
	F0	12		1968		32.9	
	G0	16		2816		22.3	

¹Batch subscripts indicate different enrichments used

TABLE 1 (cont.)

SUMMARY OF C-E FUEL IRRADIATED AND/OR DISCHARGED IN 1979

Reactor	Fuel Batch ¹	No. of Assemblies		No. of Fuel Rods		Avg. Batch Burnup (Gwd/Mtu)	
		Irradiated	Discharged	Irradiated	Discharged	@ 12/79	@ Discharge
Maine Yankee (cont.)	G41	4		688		24.0	
	G42	12		2064		23.5	
	H0	40		7040		20.5	
	I0	48		8448		8.5	
	I4	24		4128		12.3	
Millstone Unit 2	B	77	72	12628	11808	28.9	25.4
	C	68		11632		25.7	
	D	72		12672		13.5	
	E	72		12672		4.0	
Palisades ²	D	68	8	14688	1728	22.2	
St. Lucie Unit #1	A	9	9	1584	1584		20.3
	B	80	59	13120	9676	26.0	21.9
	C ₀	40		7040		22.9	
	C ₁	12		1968		26.6	
	C ₂	16		2624		27.7	
	D ₀	40		7040		15.7	
	D ₁	20		3520		12.7	
	E ₆	40		4928		5.9	
E ₁	28		7040		4.3		

¹Batch subscripts indicated different enrichments

²Remaining Palisades fuel belongs to EXXON



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ABSTRACT

Performance data on fuel assembly components from seven operating reactors are presented, and discussed in detail where potential problems have occurred and have been resolved. Fuel rod performance has continually improved over the last four years with the gradual changeover to the current C-E fuel design. The reliability level is estimated at better than 99.99%, based on activity levels obtained through January 1979 at each plant. Control rod guide tubes have shown various degrees of wear caused by vibration of the control rods in their fully-withdrawn position. The retrofit of wear sleeves within the top portion of the affected guide tubes during routine refueling has permitted the use of these fuel assemblies with no significant loss in performance or safety margins. Burnable poison rods made to revised specifications have eliminated the occurrence of perforated burnable poison rods, and visual examinations have confirmed the successful performance of the fuel assemblies repaired at St. Lucie I. The C-E all-Zircaloy spacer grids have demonstrated excellent performance in all C-E plants, including four cycles at Fort Calhoun. As the performance of C-E fuel assemblies is being verified through significant in-reactor experience, C-E is reorienting the emphasis of its irradiation test program to assess the high burnup performance capabilities of standard-design fuel and special fuels designed to maximize uranium utilization and lower fuel cycle costs.

Additional copies of this technical paper may be obtained by writing Communications, Dept. 7021-1904, Windsor. Please mention the number (TIS-6171) that appears in the lower right corner of the front cover.