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YANKEE NUCLEAR POWER STATION

OPERATION REPORT NO. 115

For the Month of

July 1970

Submitted by

YANKEE ATOMIC ELECTRIC COMPANY

Westboro Massachusetts

August 20, 1970

This report covers the operation of the Yankee Atomic Electric Company at Rowe, Massachusetts for the month of July, 1970.

During the period, plant load varied between 171.2 MWe and 184.4 MWe as the circulating water inlet temperature fluctuated between 63°F and 47°F.

During the period the primary to secondary leak rate increased from 153 to 526 gallons per day. On July 21, sodium hydroxide was added to the main coolant system for the purpose of determining individual steam generator leak rates. This was accomplished by means of a tracer technique utilizing the sodium neutron gamma reaction product, Na^{24}. Results of the leak rate test indicated the Nos. 1 and 3 steam generators to be the prime offenders with approximately two thirds of the leakage volume coming from No. 3.

The first shipment of new fuel for Core IX, consisting of 12 assemblies, was delivered on site.

The monthly control rod exercise was performed on July 15.

The fifth, Core VIII vapor container air leakage surveillance period was terminated and the sixth such period was commenced on July 29. Leakage during the entire report period was normal.

Plant Abnormal Occurrences

There were no plant abnormal occurrences during the report period.

Plant Load Reductions

July 4 (0115-0415):	Load reductions to 140 MWe due to electrical storms.
July 4 (1815-2125):	" " " " " " "
July 12 (1525-2020):	" " " " " " "
July 18 (1645-1752):	" " " " " " "
July 28 (1320-1650):	" " " " " " "
July 28 (1900-2155):	" " " " " " "
July 30 (1500-1715):	" " " " " " "
July 10 (1145-13__):	Load reduction to 135 MWe for turbine throttle valve test.

Plant Shutdowns

There were no plant shutdowns during the report period.

Plant Maintenance

The following is a list of pertinent plant maintenance items performed by the plant staff during the month of July, 1970.

1. The No. 3 charging pump was repacked, and one refurbished plunger was installed.

2. The upper flange gasket for No. 1 feedwater heater level controller was replaced. The gauge glass for this heater was also replaced.

Reactor Plant Performance

The following parameters were determined by means of incore instrumentation:

569.5 MWt; 519.8°F Tavg; Control Rod Groups A,B,C and D @ 90°; 0 ppm boron.

F_Q = 1.9

$F_{\Delta H}$ = 2.0

Minimum DNBR = 3.7

Maximum Outlet Temperature = 584.6°F.

Secondary Plant Performance

Feedwater heater terminal differences were as follows:

No. 1 = 5.59°F No. 2 = 10.56°F No. 3 = 5.66°F

The Condenser performance was as follows:

173.0 MWe; 2.40" Hg. B.P.; 579.0 MWt; 63.3°F C.W. in; TTD = 21.85°F; cleanliness factor = 76.94%.

Chemistry

On July 1 and 2, a 70,000 gallon dilution of the main coolant system reduced the boron concentration from 119 ppm to 10.5 ppm, and anion exchange further reduced the boron concentration to 1.98 ppm.

On July 21, sodium hydroxide was added to the main coolant system as a primary to secondary leak tracer. On July 22, a mixed bed ion exchanger was placed in service to remove the sodium. Concurrently ammonia was added to the system to saturate the mixed bed and to maintain the elevated pH caused by the sodium. The ammonia concentration was maintained at an average of 10.3 ppm throughout the balance of the report period.

During the month of July the main coolant pH varied from a low of 5.49 under borated conditions, to a high of 9.94 due to boron dilution with subsequent addition of sodium hydroxide and ammonium hydroxide.

The main coolant average gross beta-gamma activity was 6.72×10^{-2} uc/ml except during the sodium test period when a maximum of 6.97×10^{-1} uc/ml was noted. The coolant crud level averaged 0.04 ppm during the report period.

The main coolant tritium concentration was decreased from 9.80×10^{-1} uc/ml to 1.39×10^{-1} uc/ml by the July 1-2 70,000 gallon dilution, followed by a buildup to 1.53 uc/ml at the end of the period.

The average iodine-131 specific activity was 2.75×10^{-5} uc/ml and the iodine 131/133 atomic ratio was 0.51 indicating the absence of detectable fuel defects.

A representative crud sample for the month, collected on July 8, had the following radiochemical analyses: dpm/mg crud

Cr-51 1.38×10^{7}	Mn-54 1.78×10^{6}	Fe-59 3.08×10^{6}
Co-58 1.44×10^{7}	Co-60 2.73×10^{6}	Ag-110M 2.78×10^{6}

A main coolant gas sample for the month, collected on July 28, had the following radiochemical analyses: uc/cc gas

Xe-133 4.64×10^{-3}	Xe-135 8.31×10^{-3}	Ar-41 8.87×10^{-1}

Health and Safety

One shipment of 58 drums of low level radioactive waste, containing a total activity of 74.6 mc, was made durirg the period.

Waste disposal liquid releases totalled 105,560 gallons containing 0.065 mc of gross beta-gamma activity and 173.80 curies of tritium. Gaseous releases during the period totalled 4.659 curies of gross beta-gamma activity. Secondary water discharged totalled 262,695 gallons containing 2.758 mc of gross beta-gamma activity and 33.8 curies of tritium.

Radiation exposure doses for Yankee plant personnel, as measured by film badge, for the month of July, 1970 were as follows:

Average accumulated exposure dose: 69 mrem

Maximum accumulated exposure dose: 260 mrem

Operations

Attached is a summary of plant operating statistics and a plot of daily average load for the month of July, 1970.

YANKEE ATOMIC ELECTRIC COMPANY - OPERATING SUMMARY

July 1970

ELECTRICAL		MONTH	YEAR	TO DATE
Gross Generation	KWH	131,544,200	858,743,600	11,074,402,100
Sta. Service (While Gen. Incl. Losses)	KWH	8,044,239	51,205,355	721,210,219
Net Output	KWH	123,499,961	807,538,245	10,353,191,881
Station Service	%	6.12	5.96	6.51
Sta. Service (While Not Gen. Incl. Losses)	KWH	0	1,538,483	30,446,412
Ave. Gen. For Month (744)	KW	176,807	-	-
Ave. Gen. Running (744)	KW	176,807	-	-

PLANT PERFORMANCE				
Net Plant Efficiency	%	28.66	29.44	28.49
Net Plant Heat Rate	BTu/KWH	11,908	11,592	11,979
Plant Capacity Factor	%	96.54	89.88	75.63
Reactor Plant Availability	%	100.00	94.56	84.50

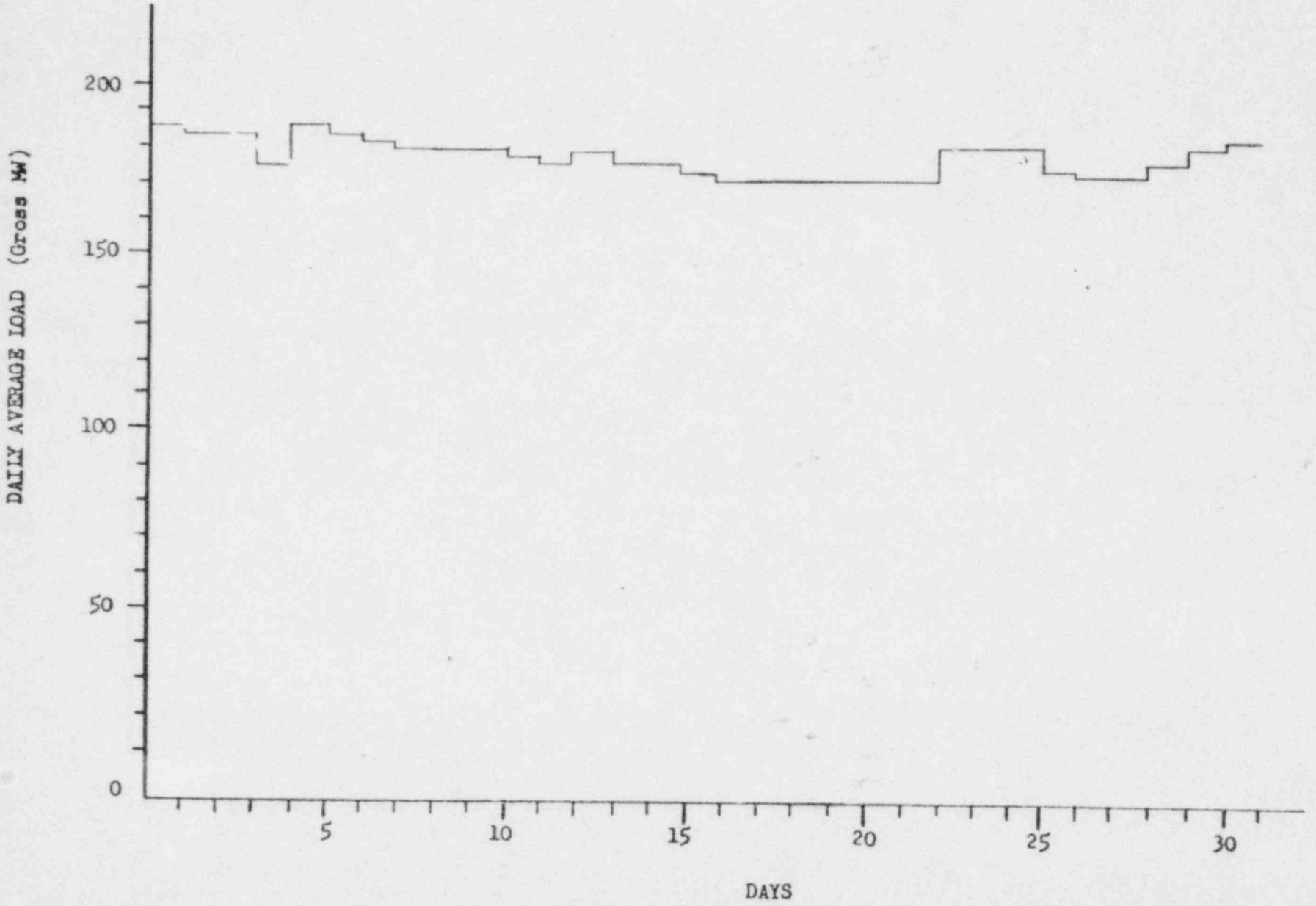
NUCLEAR		MONTH	CORE VIII	TOTAL
Hours Critical	HRS	744	7,238.42	73,058.20
Times Scrammed		-	4	61
Burnup				
Core Average	MWD/MTU	864.25	8,261.45	-
Region Average	MWD/MTU			
A (INNER)		860.37	7,668.54	27,599.44
B (MIDDLE)		981.06	9,455.76	21,491.82
C (OUTER)		747.60	7,107.75	7,107.75
D (ZIRCALOY)		-	-	-

YANKEE ATOMIC ELECTRIC COMPANY

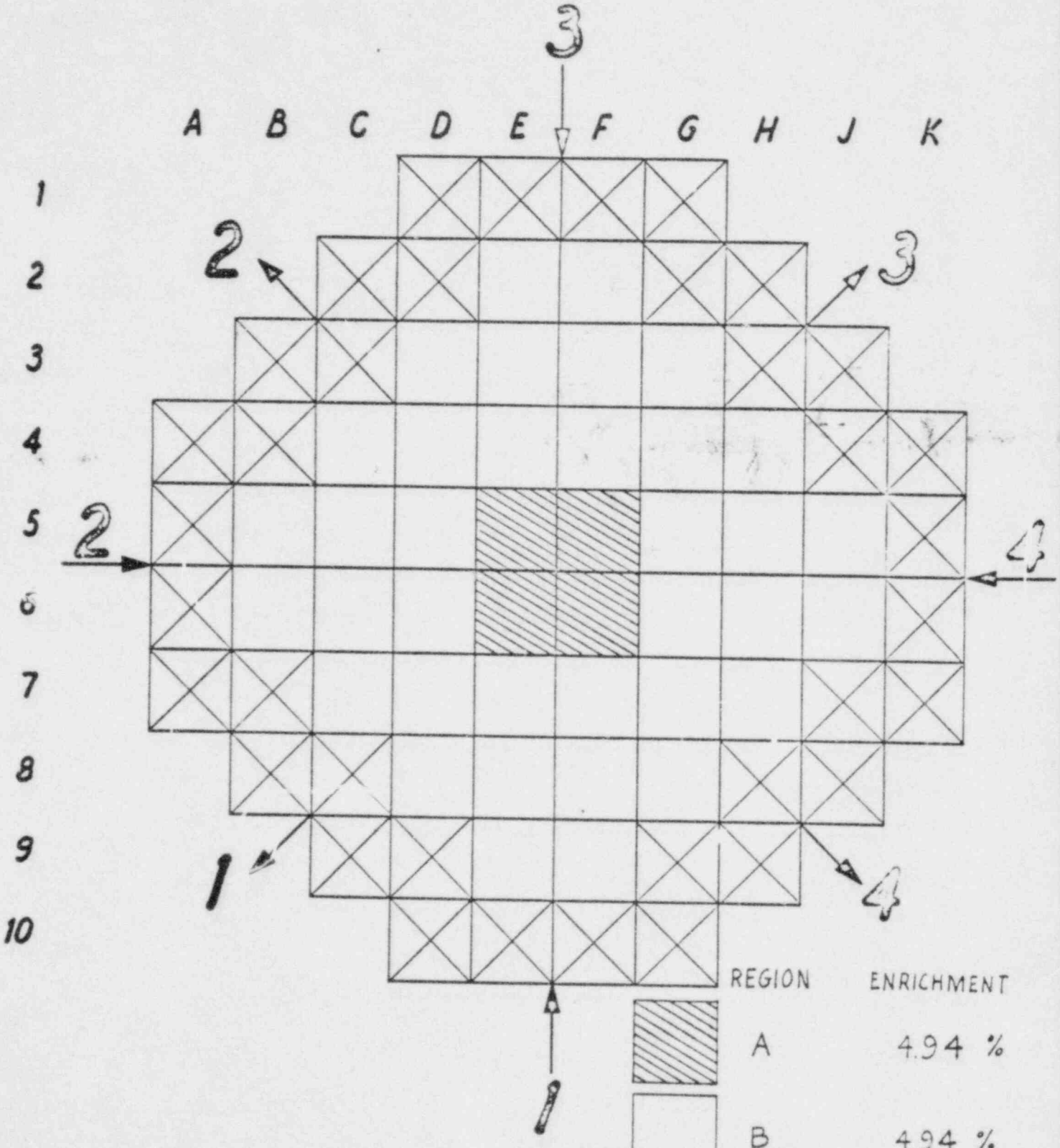
DAILY AVERAGE LOAD

for

July 1970



CORE VIII



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