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YANKEE NUCLEAR POWER STATION

OPERATION REPORT NO. 80

For the month of

AUGUST 1967

Submitted by

YANKEE ATOMIC ELECTRIC COMPANY
Boston Massachusetts

September 28, 1967

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This report covers the operation of the Yankee Atomic Electric Company plant at Rowe, Massachusetts for the month of August, 1967.

At the beginning of the period the plant was operating at approximately 176 MWe. Thereafter plant load varied between 170 MWe and 175 MWe as circulating water inlet temperature varied between 50°F and 65°F.

On two different occasions plant load was reduced to approximately 80 MWe in order to perform condenser leak tests and tube plugging. The first leak test was initiated at 1150 hours August 14. Slowly increasing steam generator chloride concentrations during the previous week had strongly indicated the presence of a tube leak. As a result of the leak test five tubes were plugged in the West condenser water boxes. Two were positively identified as leakers and three were considered probable leakers. At 1519 hours the condenser was returned to service and plant load increased to approximately 145 MWe while awaiting completion of repairs being performed concurrently on No. 2 circulating water pump. By 1758 hours plant load was returned to 172 MWe. Subsequent to the main condenser tube plugging accomplished on August 14 steam generator chloride concentrations decreased to normal levels. However, a slow increase was again noted approximately five days later. At 1100 hours August 23 plant load was reduced to 75 MWe in order to perform another leak test on the condenser. As a result of this test three tubes were plugged, again in the West water boxes. One tube was positively identified as a leaker and two others as probable leakers. By 1630 hours the condenser had been closed out and plant load was returned to 600 MWt.

At 1618 hours August 10 the Z-126 115 KV line was opened at the Harriman end due to a failure at the Harriman Station. Plant load was reduced to 450 MWt and various operational procedures and precautions consistent with single 115 KV line plant operation were implemented. By 1843 hours the Z-126 line was returned to normal service and shortly thereafter a plant load of 600 MWt was attained.

On July 9 plant load was reduced to 135 MWe for approximately one hour to conduct the monthly exercise of the turbine throttle and control valves. All valves functioned normally.

The monthly control rod exercise was conducted on August 30. All rods functioned normally. On August 31 rod groups B, C, and D were banked at 89-2/8 inches. This was the seventh step of the Core VI maximum withdrawal limitation program for distribution of guide block wear.

The fourth Core VI air charge to the vapor container was completed August 2 when the total weight of dry air in the vapor container was approximately 66,000 pounds (~ 1.5 psig). The vapor container air leakage rate was normal throughout the remainder of the reporting period.

No plant shutdowns or reactor scrams occurred during the month of August.

Plant Maintenance

The following is a list of major plant maintenance items performed by the plant staff for the month of August 1967:

1. No. 2 circulating water pump upper motor bearing and bearing race were replaced. The race had been found to be cracked and the bearing rollers badly chipped.
2. Carbon seal rings were replaced in No. 1 and No. 3 charging pumps.
3. A leaking drain valve was replaced in the charging pump suction line.
4. Radiation shields for the reactor head pressure housings were fabricated for use during the next refueling shutdown.
5. No. 2 battery charger commutator was machined.
6. A turbine spindle turning fixture was fabricated.
7. The thrust bearing on No. 1 service water pump was replaced.
8. The primary vent stack was inspected and found to be free of corrosion.

Instrumentation and Control

The following is a list of the major instrumentation and control maintenance items performed by the plant staff during the month of August 1967:

1. Two defective BF3 nuclear instrument chambers were disassembled and inspected.
2. A low pressure gland steam supply pressure gage was installed at the main control board.

3. Leak repairs were affected on the charging pump flow transmitter line.

Reactor Plant Performance

Core reactivity depletion was normal at approximately 0.70% Δ K/K per 1000 MWtD/MTU.

The following parameters were determined by means of incore instrumentation at 599.2 MWt, 526.4°F avg, 380 ppm boron, control rod groups B, C, & D at 88 7/8 and Group A at 81 0/8;

Fq	=	2.32
FAH	=	1.98
Minimum DNBR	=	3.2
Maximum Outlet Temperature	=	589.5°F

During the monthly control rod exercises position indicating coil stack voltage plots had indicated that control rod No. 8 was low by five steps. On August 31, while performing the seventh step of the Core VI maximum withdrawal limitation program, control rod No. 8 position was brought into conformance with its associated rod group.

Secondary Plant Performance

Feedwater heater terminal difference at 170 MWe, 3.5" Hg backpressure and 526.0°F Tave:

#1 - 5.9°F #2 - 16.4°F #3 - 9.60°F

Condenser terminal difference: 35.9°F

Chemistry

During the period the main coolant boron concentration decreased from 445 ppm to 304 ppm. The average main coolant specific activity was 4.83×10^{-2} uc/ml and the average system crud level was 0.17 ppm. The main coolant iodine-131 specific activity was 1.79×10^{-5} uc/ml; the I-131/I-133 atomic ratio was 0.65. The average main coolant tritium specific activity was 1.36 mc/ml.

A representative crud sample for the month collected on August 16, had the following radiochemical analyses: dpm/mg crud

Cr-51	Hf-181	Mn-54	
2.25×10^6	1.23×10^5	1.58×10^6	
Fe-59	Co-58	Co-60	Ag-110m
1.51×10^6	1.06×10^7	2.85×10^6	3.45×10^4

A main coolant gas sample collected on August 14 had the following radiochemical analyses: uc/cc gas

Xe-133	Xe-135	Ar-41
4.78×10^{-3}	7.37×10^{-4}	2.26×10^{-2}

Health and Safety

Three shipments of low level radioactive waste were made during the period comprised of 169 drums containing a total activity of 1.31 curies.

One shipment of high level radioactive waste was made comprised of fourteen drums with a total activity of 535 mc.

During August the waste disposal liquid releases totaled 184,000 gallons containing 0.574 mc of gross beta-gamma activity and 93.676 curies of tritium. Gaseous waste releases during the same period totaled 16.89 mc of gross beta-gamma activity.

Secondary plant water discharged during the period consisted of 239,000 gallons containing a total of 7.5 uc of gross beta-gamma activity and 0.329 curies of tritium.

Radiation exposure doses for Yankee plant personnel as measured by film badge for the month of August 1967 were:

Average accumulated exposure dose 62 mrem

Maximum accumulated exposure dose 347 mrem

Operations

Attached is a summary of plant operating statistics and a plot of daily average load for the month of August 1967.

YANKEE ATOMIC ELECTRIC COMPANY -- OPERATING SUMMARY

AUGUST 1967

ELECTRICAL

		<u>MONTH</u>	<u>YEAR</u>	<u>TO DATE</u>
Gross Generation	KWH	128,516,500	843,646,900	7,206,107,400
Sta. Service (While Gen. Incl. Losses)	KWH	8,047,114	51,082,575	481,105,397
Net Output	KWH	120,469,386	792,564,325	6,725,002,003
Station Service	%	6.26	6.05	6.68
Sta. Service (While Not Gen. Incl. Losses)	KWH	0	933,217	24,728,684
Ave. Gen. For Month (744.00)	KW	172,737	- -	- -
Ave. Gen. Running (744.00)	KW	172,737	- -	- -

PLANT PERFORMANCE

Net Plant Efficiency	%	27.27	28.31	28.44
Net Plant Heat Rate	BTu/KWH	12515	12055	12000
Plant Operating Factor	%	98.98	80.03	72.26
Reactor Plant Availability	%	100.00	88.01	82.58

NUCLEAR

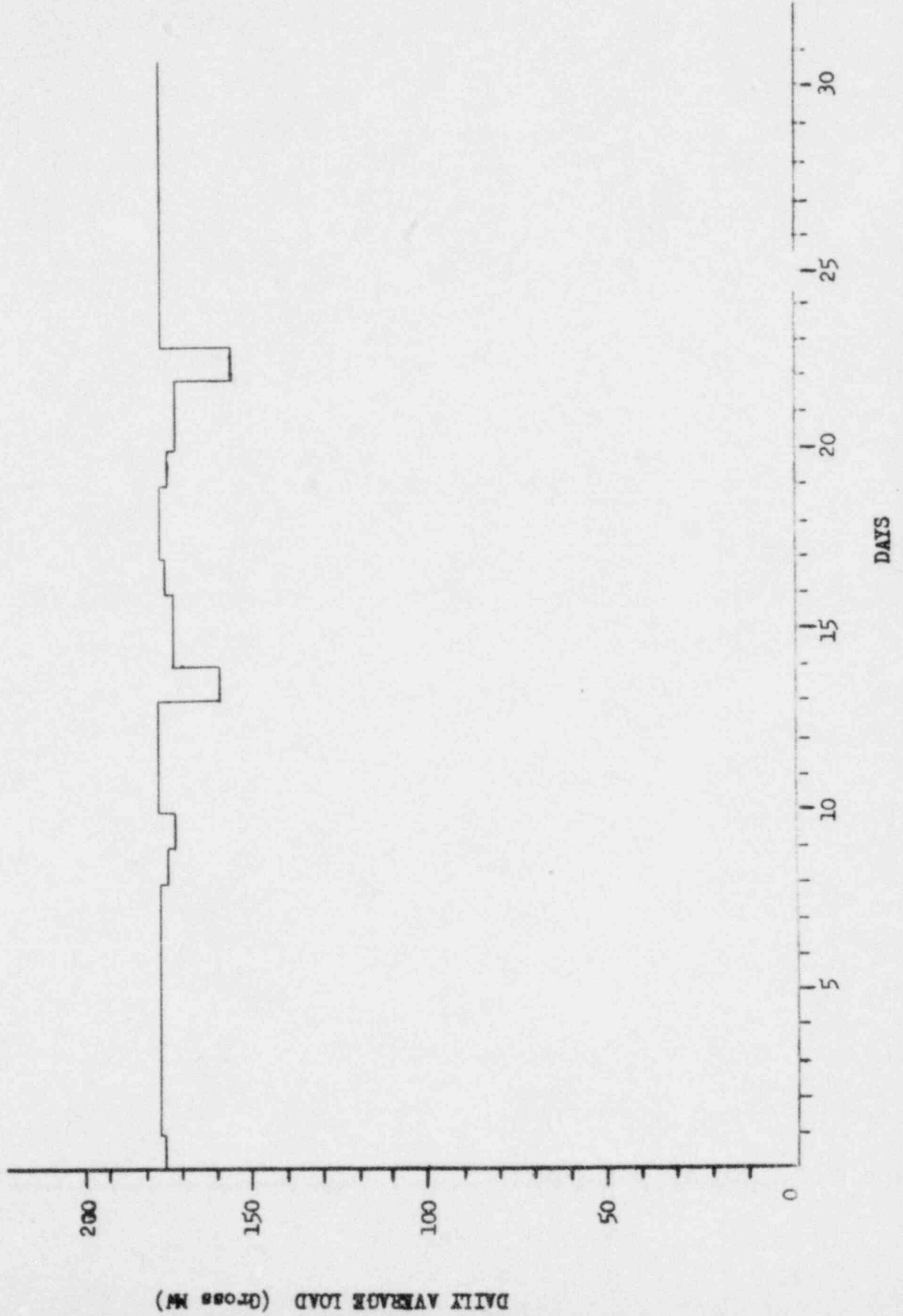
		<u>MONTH</u>	<u>CORE VI</u>	<u>TOTAL</u>
Hours Critical	HRS	744	6473.05	50,198.73
Times Scrammed		0	2	54
Burnup				
Core Average	MWD/MTU	886.14	7096.00	- -
Region Average	MWD/MTU			
A (INNER)		876.741	7121.151	23,893.65
B (MIDDLE)		1058.103	8495.517	16,170.80
C (OUTER)		715.073	5692.482	5692.48

YANKEE ATOMIC ELECTRIC COMPANY

DAILY AVERAGE LOAD

for

AUGUST 1967



CORE VIREGION LOCATIONS

