YANKEE NUCLEAR POWER STATION

OPERATION REPORT NO. 130

For the Month of

October 1971

Submitted by

YANKEE ATOMIC ELECTRIC COMPANY

Westboro Massachusetts

November 19, 1971

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This report covers the operation of the Yankee Atomic Electric Company at Rowe, Massachusetts, for the month of October, 1971.

At the start of the period, plant load was 179.9 MWe. One scheduled plant shutdown occurred during the period for the purpose of effecting repairs to the No. 1 steam generator. The turbine generator was separated from the high line on October 29 at 2202 hours and the plant was placed in a cold shutdown condition which continued through the remainder of the report period. During the period October 1 - 29 the primary to secondary leak rate had increased from 102 to 120 gallons per day.

On October 31, the manway covers were removed and the seal welds were cut on the diaphragms for the No. 1 steam generator primary side manways. The diaphragms were removed and one leaking tube on the inlet side was identified for plugging. A tube integrity test utilizing an eddy current probe technique revealed seven additional tubes to have localized defect penetrations of greater than 50 percent of the tube wall thickness. All eight tubes, the one known leaker and the seven potential leakers, were plugged utilizing explosive welding of a thimble type plug to the tube internal surface. Work area radiation levels in the inlet and outlet water boxes were 5-24 r/hr and 4 to 16 r/hr respectively.

At the end of the report period the plant was shutdown and repairs to No. 1 steam generator were in progress.

An accident emergency drill was performed on October 27 involving actual evacuation of the plant by all non-operating personnel. A review of the drill was conducted by the Plant Operations Review Committee.

The seventh, Core IX vapor container air leakage surveillance period was terminated October 29, coincident with reactor shutdown. Leakage during the period was normal.

Plant Abnormal Occurrences

There were no plant abnormal occurrences during the report period.

Plant Load Reductions

October 6 (1144-1219): Plant load reduction to 172 MWe for turbine control valve exercising.

October 6 (1435-1700): Plant load reduction to 140 MWe due to an electrical storm.

October 13 (1146-1224): Plant load reduction to 173 MWe for turbine control valve exercising.

October 20 (1145-1215): Plant load reduction to 168 MWe for turbine control valve exercising.

October 27 (1145-1215): Plant load reduction to 170 MWe for turbine control valve exercising.

Plant Shutdowns

Shutdown No. 119-10-71: 10-29-71, commenced scheduled plant shutdown for No. 1 steam generator leak repairs. Outage still current at end of report period.

Plant Maintenance

The following is a list of pertinent maintenance items performed by the plant staff during the month of October, 1971.

1. The No. 3 charging pump was repacked.

2. The turbine generator exciter commutator was stoned.

3. A discharge valve seat in the No. 1 charging pump was replaced.

Instrumentation and Control

The following is a list of pertinent instrumentation and control maintenance items performed by the plant staff during the month of October, 1971.

1. The steam regulating valves for the two waste liquid holdup tanks were rebuilt.

2. The No. 4 neutron power level meter was replaced.

3. The cam followers on the wide range and narrow range steam generator level receivers were replaced.

Reactor Plant Performance

The following parameters were determined by means of incore instrumentation:

585.1 MWt; 523.8°F Tave; Control Rod Group A @ 90", B,C,D, @ 89^{5}"; 17.9 ppm boron

F_Q = 1.8

$F_{\Delta H}$ = 2.0

Minimum DNBR = 3.7

Maximum outlet temperature = 587.5°F

Secondary Plant Performance

Feedwater heater terminal differences were as follows:

No. 1 = 5.0°F No. 2 = 5.3°F No. 3 = 5.5°F

The condenser performance was as follows:

178.6 MWe; 2.25"Hg B.P.; 595.5 MWt; 54.2°F C.W. in; TTD = 29.8°F; cleanliness factor = 66.3%

Chemistry

During the period October 1-29 the main coolant pH averaged 6.52. On October 30 the main coolant was borated to a 5% shutdown concentration and averaged 1312 ppm with an average pH of 5.55 during the balance of the report period.

The main coolant boron concentration was reduced from 105 ppm at the start of the period to 7 ppm on October 5 to compensate for normal core depletion. Coincident with this dilution the main coolant tritium concentration decreased from 1.59 uc/ml to 1.55×10^{-1} uc/ml. The tritium concentration thereafter increased to 1.65 uc/ml at the start of the shutdown period.

During the period of power operation, October 1-29, the average gross beta-gamma activity and crud level were 7.28×10^{-2} uc/ml and 0.04 ppm respectively. On October 31, with the plant in a cold shutdown condition the gross beta-gamma activity reached a maximum of 5.82×10^{-1} uc/ml.

During the October 1-29 period of power operation the average iodine 131 specific activity was 1.77×10^{-4} uc/ml and the iodine 131/133 atomic ratio averaged 1.94.

A crud sample for the month collected on October 29 had the following radiochemical analyses: dpm/mg crud

Cr-51	Mn-54	Fe-59
2.90×10^{7}	1.96×10^{6}	3.92×10^{6}
Co-58	Co-60	Ag-110M
1.69×10^{7}	3.92×10^{6}	6.43×10^{5}

A main coolant gas sample, collected on October 5 had the following radiochemical analyses: uc/cc gas

Xe-133	Xe-135	Ar-41
2.85×10^{-1}	1.51×10^{-1}	1.45

Health and Safety

One shipment of 58 drums of low level waste containing 32.8 mc was made during the period.

Waste disposal liquid releases totalled 85,385 gallons containing 0.085 mc of gross beta-gamma activity and 233.18 curies of tritium. Gaseous releases during the period totalled 1.135 curies of gross beta-gamma activity. Secondary plant water discharged totalled 421,697 gallons containing 0.426 mc of gross beta-gamma activity and 16.615 curies of tritium.

An additional release of 2.036 curies of tritium as a vapor was discharged to the environs during the period.

Radiation exposure for Yankee plant personnel and N.E.P.S.Co. personnel as measured by film badge, for the month of October, 1971 were:

Yankee Plant Personnel:

Average accumulated exposure dose: 112 mrem

Maximum accumulated exposure dose: 700 mrem

*N.E.P.S.Co. Personnel:

Average accumulated exposure dose: 127 mrem

Maximum accumulated exposure dose: 400 mrem

Operations

Attached is a summary of plant operating statistics and a plot of daily average load for the month of October, 1971.

* N.E.P.S.Co personnel on site during the report period. Exposure determined from daily dosimeter readings.

YANKEE ATOMIC ELECTRIC COMPANY - OPERATING SUMMARY

October 1971

ELECTRICAL		MONTH	YEAR	TO DATE
Gross Generation	KWH	122,745,200	1,293,526,000	12,789,397,300
Sta. Service (While Gen. Incl. Losses)	KWH	7,523,696	78,610,763	826,635,788
Net Output	KWH	115,221,504	1,214,915,237	11,962,761,512
Station Service	%	6.13	6.08	6.46
Sta. Service (While Not Gen. Incl. Losses)	KWH	118,100	606,983	32,895,838
Ave. Gen. For Month (745)	KW	164,758.7	-	-
Ave. Gen. Running (694.03)	KW	176,858.6	-	-

PLANT PERFORMANCE				
Net Plant Efficiency	%	28.14	28.47	28.49
Net Plant Heat Rate	BTu/KWH	12,128	11,987	11,979
Plant Capacity Factor	%	91.62	97.48	76.86
Reactor Plant Availability	%	93.16	98.41	85.05

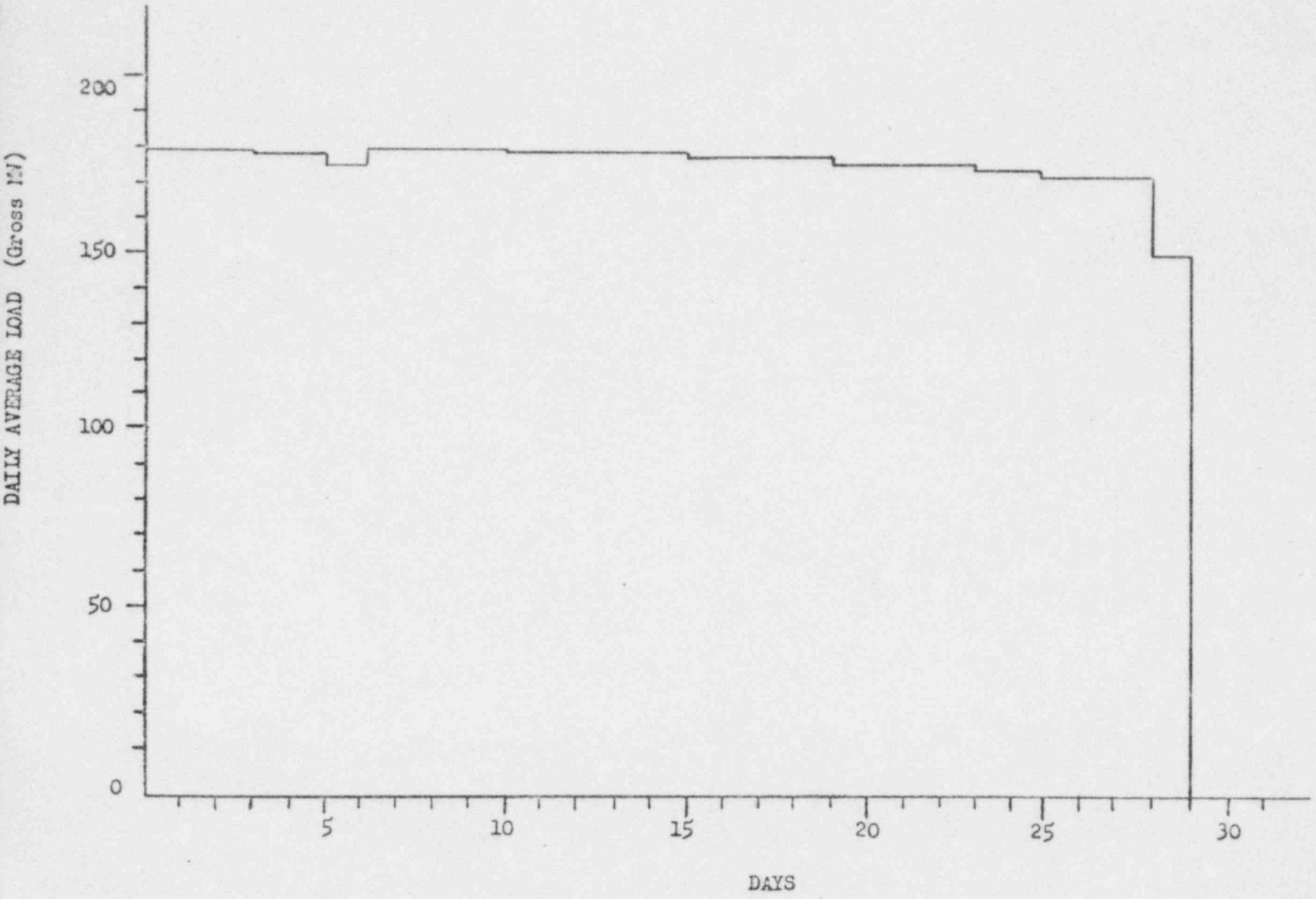
NUCLEAR		MONTH	CORE IX	TOTAL
Hours Critical	HRS	694.03	7,998.42	82,962.82
Times Scrammed		0	3	64
Burnup				
Core Average	MWD/MTU	821.40	9,454.74	-
Region Average	MWD/MTU			
A (INNER)		839.23	9,214.38	26,418.05
B (MIDDLE)		954.43	11,086.21	19,826.06
C (OUTER)		686.56	7,851.46	7,851.46
D (ZIRCALOY)		-	-	-

YANKEE ATOMIC ELECTRIC COMPANY

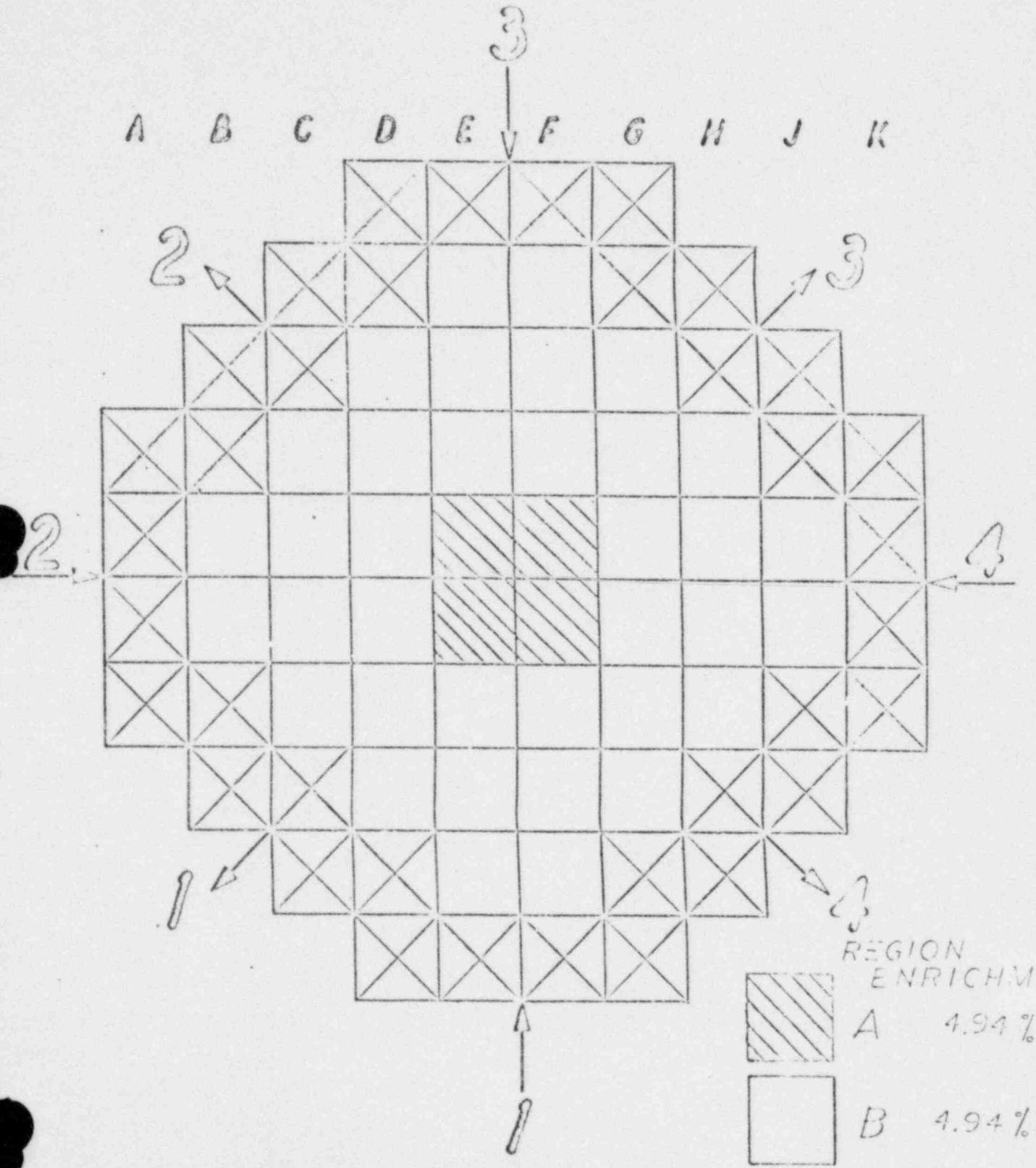
DAILY AVERAGE LOAD

for

October 1971



CORE IX



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