YANKEE NUCLEAR POWER STATION

OPERATION REPORT NO. 82

For the month of

OCTOBER 1967

Submitted by

YANKEE ATOMIC ELECTRIC COMPANY
Boston Massachusetts

November 30, 1967

being fabricated. In addition to the removal of the platforms the boral fuel storage rack and fuel assembly up-ender were also removed from the pit and transfered to the decontamination building for decontamination. Shortly thereafter final cleaning and inspection of the pit was initiated. During the course of this inspection it was noted that the blisters previously observed and inspected in the phenolic coating on the walls were more prevelent in the area immediately adjacent to the location of the aluminum storage racks. Additionally, it was noted that there was a small but continuous vertical crack in the pit approximately fifteen feet in length which ultimately terminated in a construction joint approximately ten feet above grade level. Although the crack was small, approximately 0.01 inches in width, it was deemed advisable to obtain the opinion of outside consultants. Two structural engineers inspected the pit at the latter part of the reporting period. As a result of this inspection it was concluded that the cracking was caused by shrinkage rather than settlement or strain, a common occurrence in concrete structures. Moreover, it was believed that the width of the crack would not permit liquid leakage. However, as a precautionary measure the phenolic coating in the vicinity of the crack will be removed and the entire crack length re-covered with fiberglass prior to re-coating.

On October 25, AEC Reactor Operator License written examinations for six candidates were administered by an AEC examiner. On October 26 Senior Operator written examinations were administered to five candidates and oral examinations for the Reactor Operator candidates were started. Oral examinations were continued through October 27 and on October 28 demonstrative examinations for Reactor Operator candidates were concluded.

On October 11 plant load was reduced to approximately 140 MWe for one and one half hours to exercise the turbine throttle and control valves. All valves functioned normally.

The vapor container air leakage rate was normal throughout the reporting period.

Plant Shutdowns:

Shutdown No. 91-6-6	10-28-67	Scheduled shutdown for administration of AEC Operator Examinations. Total outage time: 9.02 hours.

Plant Maintenance:

The following is a list of major plant maintenance items performed by the plant staff during the month of October, 1967:

1. Seal rings were replaced in No. 1 charging pump.

2. All fuel storage racks were removed from the spent fuel pit and decontaminated.

3. The spent fuel pit fuel assembly up-ender was removed from the pit, decontaminated, inspected, and the spare reconditioned operating cylinder installed.

4. The fuel storage rack wood platforms were removed and disposed of and new cypress platforms were fabricated.

5. Surface imperfections in the spent fuel pit phenolic coating were cleaned, explored, and prepared for patching.

6. Seven leaking tubes were plugged in the evaporator reboiler.

7. The gravity drain pump was replaced consequent to the failure of the pump shaft.

8. Lighting fixture supports and wiring was installed in the new decontamination building.

9. The turbine lube oil reservior vent stack was weather proofed to prevent freezing and reduce building oil staining.

Instrumentation and Control

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

1. Extensive tests were conducted on a mock up of a flux wire drive train and associated relays in the instrument shop.

2. Water and air temperature recorders were removed from the Deerfield River test stations.

3. A smear counter system for use at the accident emergency plan assembly point was assembled and tested.

4. The gate house portal monitor was recalibrated.

Reactor Plant Performance

Core reactivity depletion was normal at approximately 0.70 % Δ K/K per 1000 MWtD/MTU. November 9 is the estimated end of core full power operation without pH variation or stretchout operations.

During the period eight new unitized shim rods were delivered. These are replacements for the mechanically coupled rods presently in use in the reactor.

The following parameters were determined by means of incore instrumentation at 599.5 MWt, 525.8°F Tavg. 40 ppm boron, control groups B, C, and D at 89 5/8 and group A at 87 3/8:

F_q = 2.3

$F_{\Delta H}$ = 2.0

Min. DNBR = 3.13

Maximum outlet temperature = 594.0°F

Secondary Plant Performance

Feedwater heater terminal difference 172.0 MWe, 3.2" Hg backpressure and 526.2°F Tavg:

1 6.1°F # 2 16.7°F # 3 11.1°F

Condenser terminal difference 39.25°F

Chemistry

During the period the main coolant boron concentration decreased from 167 ppm to 83 ppm. The average main coolant specific activity was 6.28×10^{-2} uc/ml and the average system crud level was 0.10 ppm. The main coolant iodine-131 specific activity was 2.56×10^{-5} uc/ml; the iodine-131/133 atomic ratio was 0.84. The main coolant tritium specific activity decreased from 2.34 uc/ml to 7.82×10^{-1} uc/ml as a result of main coolant system dilutions to decrease the boron concentration.

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

Cr-51	Hf-181	Mn-54	Fe-59
4.26×10^6	1.16×10^5	1.63×10^6	2.12×10^6

Co-58	Co-60	Ag-110m
8.12×10^6	2.88×10^6	2.20×10^5

A main coolant gas sample collected on October 6 had the following radiochemical analyses: uc/cc gas

Xe-133	Xe-135	Ar-41
9.85×10^{-3}	2.59×10^{-2}	3.27×10^{-1}

Health and Safety

During October the waste disposal liquid releases totaled 216,000 gallons containing 4.42 mc of gross beta-gamma activity and 51.322 curies of tritium. Gaseous waste releases during the same period totaled 110.80 mc of gross beta-gamma activity.

Secondary plant water discharged during the period consisted of 227,000 gallons containing a total of 6.9 uc of gross beta-gamma activity and 0.141 curies of tritium.

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

Average accumulated exposure dose	118	mrem.
Maximum accumulated exposure dose	701	mrem.

Operations

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

YANKEE ATOMIC ELECTRIC COMPANY -- OPERATING SUMMARY

OCTOBER 1967

ELECTRICAL		MONTH	YEAR	TO DATE
Gross Generation	KWH	126,565,000	1,095,458,700	7,457,919,200
Sta. Service (While Gen. Incl. Losses)	KWH	7,982,225	66,899,672	496,922,494
Net Output	KWH	118,582,775	1,028,559,028	6,960,996,706
Station Service	%	6.31	6.11	6.66
Sta. Service (While Not Gen. Incl. Losses)	KWH	64,554	997,771	24,793,238
Ave. Gen. For Month (745.00)	KW	169,886	- -	- -
Ave. Gen. Running (735.58)	KW	172,062	- -	- -

PLANT PERFORMANCE				
Net Plant Efficiency	%	27.22	28.06	28.40
Net Plant Heat Rate	BTu/KWH	12,538	12,162	12,017
Plant Operating Factor	%	97.47	83.72	72.95
Reactor Plant Availability	%	99.12	90.33	82.99

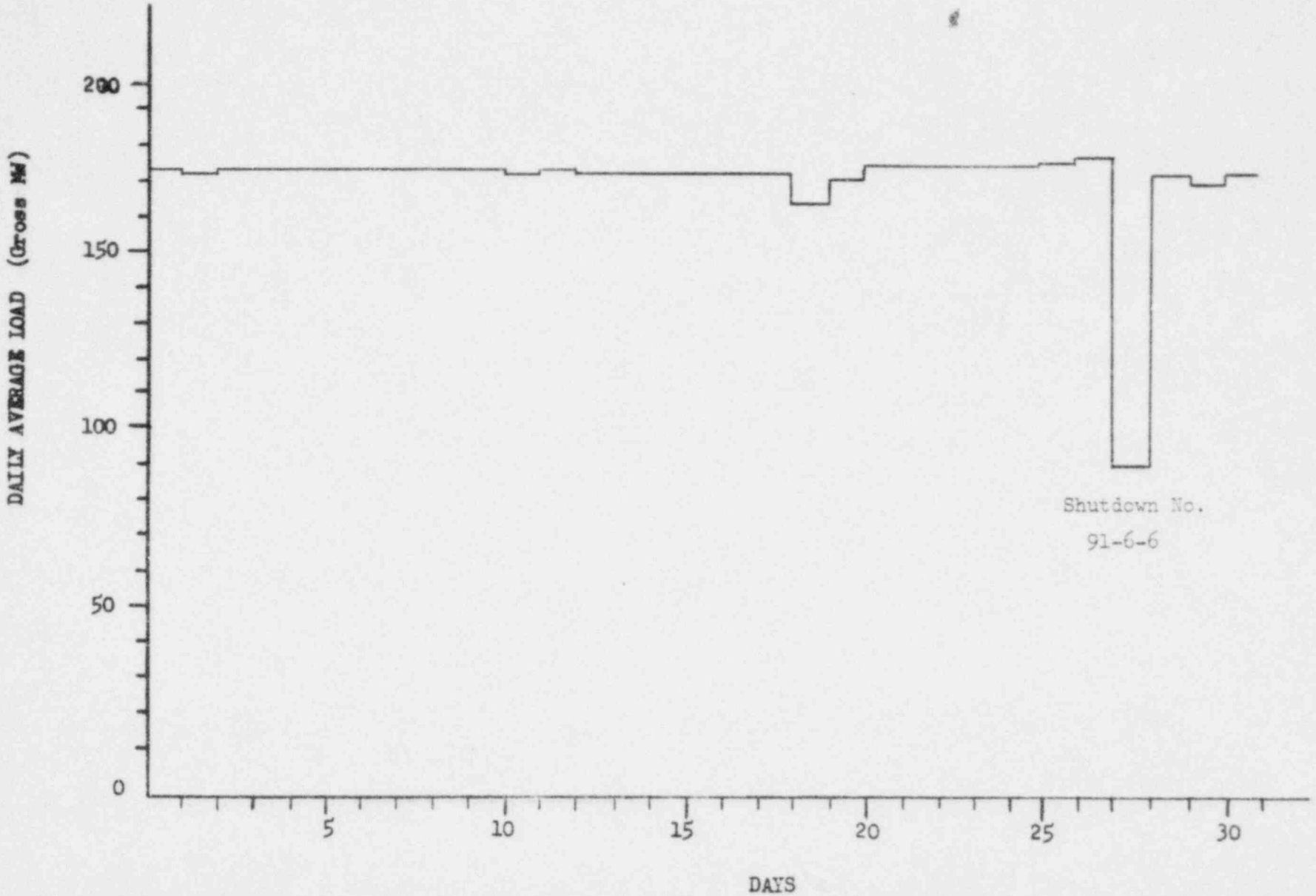
NUCLEAR		MONTH	CORE VI	TOTAL
Hours Critical	HRS	738.42	7931.47	51,657.15
Times Scrammed		0	2	54
Burnup				
Core Average	MWD/MTU	873.76	8831.11	- -
Region Average	MWD/MTU			
A (INNER)		894.937	8878.649	25,651.15
B (MIDDLE)		1044.487	10,569.634	18,244.92
C (OUTER)		700.647	7085.963	7085.96

YANKEE ATOMIC ELECTRIC COMPANY

DAILY AVERAGE LOAD

for

OCTOBER 1967



CORE VI REGION LOCATIONS