

SAXTON NUCLEAR EXPERIMENTAL CORPORATION

Operations Report for June 1969

1. GENERAL

At the beginning of this report period the main coolant system was in a cold shutdown condition in a continuation of the plant outage which was begun on October 18, 1968.

On June 4 and 5, five assemblies were installed in the reactor vessel. On June 6, conoseals were installed and instrumentation installation commenced.

Installation and repair of the field welds on the pressurizer safety valve water seal and the recirculation system piping were completed during the month.

2. REACTOR OPERATIONS

On June 21, filling and venting of the main coolant system was initiated. After pressurizing to 450 psig, several leaks were found on the reactor head instrumentation. The system was depressurized and the leaks repaired.

On June 25, a 1/M versus control rod position with 1331 ppm boron was run to determine the shutdown margin. No increase in count rate was observed with all control rods fully withdrawn. The test was repeated on June 26 with 1029 ppm boron. Criticality was predicted with rods 1, 3, 4, 5 and 6 at 40 inches and rod 2 at 24".

Control rod drop times were determined for the six control rods at ambient temperature and with flow. The measured drop times were between 806 and 863 milliseconds. In November 1965, after installation of Core II, comparable rod drop tests were conducted and the measured times were between 860 and 941 milliseconds.

On June 26, filling and venting of the main coolant system was completed. Heat-up commenced on June 27 and was completed on June 28.

3. EXPERIMENTAL PROGRAM

During the month, test subassemblies were inserted in the core as follows:

N1	503-4-31	High Burn-up Pu Rods
N2	503-4-33	High Pressure Creep Test
N3	503-4-25	High Pressure Creep Test
N4	503-4-32	Low Pressure Creep Test
N5	503-4-34	Materials Compatibility Test

4. OPERATIONAL TESTS

The SNEC fire and evacuation alarms were tested on June 6, 13, 20 and 27.

The monthly test of the radiation monitoring system was completed on June 6.

5. MAINTENANCE

The principal items of mechanical maintenance during the month included setting the lift pressure of the pressurizer safety valves on a test stand; installing the safety valves on the pressurizer water seal; installing eleven conoseals on the subassembly ports and instrumentation ports and preparing the reactor vessel head for heatup; servicing the containment vessel exhaust fan and the stack fan; removal, cleaning and replacing the containment vessel No. 1 sump pump; installing new cartridges in the storage well filter; shipping subassembly fuel handling tools to the Westinghouse Post Irradiation Facility; installing new pre-filters in chemistry laboratory exhaust air handler; and installing five shielding blocks over the reactor compartment.

The major items of electrical and instrumentation maintenance included inspecting the instrument air system dryers; repairing the containment vessel sump pump motor windings; repairing the preamplifier on the RWDF effluent monitor, RIC-6; setting flow rate and adjusting the alarm switch on site particulate monitor, RIC-8; installing new filter paper on site particulate monitors, RIC-8 and RIC-9; installing a new G-M tube in the monitor room personnel monitor; replacing vacuum tubes in the health physics office area monitor; installing a new coil in the PRV instrument air solenoid valve; stroking the letdown flow control valve, LRC-21V; checking and replacing tubes in source range channel A low voltage power supply; calibration of the main coolant flow recorder, FRC-1; stroking the component cooling flow control valve for the shutdown cooling heat exchanger, TIC-22V; repairing the primary compartment paging phone; installing a new paging phone in the control building office spaces; checking and replacing vacuum tubes in the chemistry laboratory spectrophotometer; and installing a new instrument air solenoid on the purification system demineralizer inlet valve, HIC-25V.

6. CHEMISTRY

The main coolant system was maintained in a cold shutdown condition until June 27. On June 26, boron concentration was reduced to 1029 ppm and hydrazine was added to the system prior to heat-up on June 27. The system remained in a hot shutdown condition for the remainder of the month. A summary of the analyses performed on main coolant samples taken during the month is contained in the following table:

<u>Main Coolant Samples</u>	<u>Minimum</u>	<u>Maximum</u>
pH at 25°C	5.20	5.56
Conductivity, umhos	3.44	6.15
Boron, ppm	1029	1640
Chlorides, ppm	<0.005	<0.005
Oxygen, ppm	0.005	0.005
Gross Beta-Gamma (15 Min. Degassed) uc/cc	5.85×10^{-4}	7.04×10^{-3}
Tritium, uc/cc	5.20×10^{-3}	8.05×10^{-3}

A summary of the analyses performed on the component cooling system is as follows:

<u>Date</u>	<u>pH</u>	<u>Conductivity (umhos)</u>	<u>CrO4 (ppm)</u>	<u>Activity (uc/cc)</u>
6/10	8.83	1012	470	$<1 \times 10^{-6}$

6. CHEMISTRY (Continued)

The analyses of the refueling water storage tank water is as follows:

<u>Date</u>	<u>pH</u>	<u>Conductivity (umhos)</u>	<u>Boron (ppm)</u>	<u>Activity (uc/cc)</u>
6/11	5.19	514	1633	6.96×10^{-4}

7. RADIATION AND WASTE DISPOSAL

Radiation surveying consisted of routine plant surveys, the containment vessel and materials shipments. The following maximum radiation readings were taken:

<u>Location</u>	<u>Radiation Reading</u>
<u>C&A Building</u>	
Waste Drum (baling machine)	2 mrem/hr beta-gamma
Charging Pump (contact with chamber)	10 mrem/hr beta-gamma
Sample Room (door of sample panel)	1.5 mrem/hr beta-gamma
Chemical Lab Hot Sink (1" from drain)	13 mrem/hr beta-gamma
<u>RWDF</u>	
Evaporator (under bottom)	15 mrem/hr beta-gamma
Evaporator (contact outside upper level)	6 mrem/hr beta-gamma
Drum Storage Area (at HRA fence)	18 mrem/hr beta-gamma
<u>C.V.</u>	
Primary Compartment (general upper level)	110 mrem/hr beta-gamma
Primary Compartment (contact M.C. pump volute)	400 mrem/hr beta-gamma
Primary Compartment (S.G. bottom)	130 mrem/hr beta-gamma
Primary Compartment (pressurizer bottom)	115 mrem/hr beta-gamma
Primary Compartment (general lower level)	70 mrem/hr beta-gamma
Primary Compartment (Regen. HX)	260 mrem/hr beta-gamma
Primary Compartment (Non-Regen. HX)	29 mrem/hr beta-gamma
Auxiliary Equipment Compartment (S.C.H.X.)	7 mrem/hr beta-gamma
Auxiliary Equipment Compartment (D.T. top)	7 mrem/hr beta-gamma
Auxiliary Equipment Compartment (D.T. bottom)	35 mrem/hr beta-gamma
Auxiliary Equipment Compartment (general lower level)	7 mrem/hr beta-gamma
Reactor Deck (water level at grating)	55 mrem/hr beta-gamma
Reactor Deck (instrument ports)	210 mrem/hr beta-gamma
Reactor Deck (waist level)	35 mrem/hr beta-gamma
Reactor Deck (storage well railing)	27 mrem/hr beta-gamma

Miscellaneous

Radioactive Shipments:

Fuel Handling Tools to Westinghouse - Waltz Mill	< 1 mrem/hr beta-gamma
Nuclear Detector to Westinghouse - Elmira, N.Y	< 1 mrem/hr beta-gamma

7. RADIATION AND WASTE DISPOSAL (Continued)

Contamination surveying consisted of routine plant site surveys, surveys of materials shipped, tools, equipment and the containment vessel. The clean areas were within the "Clean Area" limits. The controlled areas were generally within the "Clean Area" limits. The controlled area was cleaned frequently to keep and/or to return it to the "Clean Area" limits. The exclusion areas were cleaned periodically to minimize the amount of smearable contamination. The following contamination level were observed:

<u>Location</u>	<u>Contamination Reading</u>
<u>C&A Building</u>	
Charging Pump	94200 d/m/smear beta-gamma
Charging Pump	<10 d/m/smear alpha
Charging Room Floor	1060 d/m/smear beta-gamma
Sample Room Sink	45000 d/m/smear beta-gamma
Sample Room Sink	<10 d/m/smear alpha
Sample Room Floor	520 d/m/smear beta-gamma
Chemical Lab Hot Sink	700 d/m/smear beta-gamma
Chemical Lab Hot Sink	<10 d/m/smear alpha

RWDF

Pump Room Floor	3250 d/m/smear beta-gamma
Shipping Room Floor	<100 d/m/smear beta-gamma

C.V.

Operating Deck	4390 d/m/smear beta-gamma
Operating Deck	<10 d/m/smear alpha
Reactor Deck (head)	18250 d/m/smear beta-gamma
Reactor Deck (head)	<10 d/m/smear alpha
Reactor Deck (grating)	16800 d/m/smear beta-gamma
Reactor Deck (grating)	<10 d/m/smear alpha
Primary Compartment (grating)	17050 d/m/smear beta-gamma
Primary Compartment (grating)	<10 d/m/smear alpha

Miscellaneous

Radioactive Shipments:

Fuel Handling Tools to Westinghouse - Waltz Mill	<100 d/m/smear beta-gamma
Nuclear Detector to Westinghouse - Elmira, N.Y.	<100 d/m/smear beta-gamma

7. RADIATION AND WASTE DISPOSAL (Continued)

Liquid and gaseous effluents from the SNEC site for the month of June 1969 were as follows:

<u>Effluent Type</u>	<u>(Curie) Activity This Month</u>	<u>(Curie) Activity Year to Date</u>	<u>(Curie) Activity Last Twelve Months</u>
Liquid	0.000091	0.003389	0.008848
Tritium	0.008000	0.461041	4.260959
Air, Xe	0.000000	0.040196	2.845166
Air, I-131	0.000000	0.000000	0.000173
Air, M.F.P.	0.000000	0.000401	0.028451

Nine (9) barrels of waste were drummed for temporary storage. No drums were shipped from the site.

Radiation exposure for all SNEC personnel as measured by film badges for the month of May 1969 were a maximum of 1100 mrem with an average of 82.8 mrem.

Radiation exposure for all visiting personnel as measured by film badges for the month of May 1969 were a maximum of 0 mrem with an average of 0 mrem.

The average radiation exposure for all personnel as measured by film badges for the month of May 1969 was 75.5 mrem.

SAXTON NUCLEAR EXPERIMENTAL CORPORATION

OPERATING STATISTICS

<u>NUCLEAR</u>	<u>UNIT</u>	<u>MONTH</u>	<u>YEAR</u>	<u>TO DATE</u>
TIMES CRITICAL	NO.	0	0	823
HOURS CRITICAL	HRS.	0	0	22,943.49
TIMES SCRAMMED (MANUAL)	NO.	0	0	449
* TIMES SCRAMMED (INADVERTANT)	NO.	0	0	42
THERMAL POWER GENERATION	MWH	0	0	429,077.53
AVERAGE BURNUP (Pu Region)	MWD/MTU	0	0	18,029.02
CONTROL ROD POSITIONS AT END OF MONTH AT EQUILIBRIUM POWER OF <u>0</u> MWt				
MAIN COOLANT BORON <u>1051</u> PPM				

RODS OUT - INCHES

NO. 1 <u>0</u>	NO. 2 <u>0</u>	NO. 3 <u>0</u>
NO. 4 <u>0</u>	NO. 5 <u>0</u>	NO. 6 <u>0</u>

<u>ELECTRICAL</u>	<u>UNIT</u>	<u>MONTH</u>	<u>YEAR</u>	<u>TO DATE</u>
GROSS GENERATION	MWH	0	0	73,529.3
STATION SERVICE	MWH	125.19	539.45	15,742.85
STATION SERVICE	%	0	0	21.41
AVG. PLANT EFFICIENCY - MWH(e)/MWH(t)	%	0	0	17.14
AVG. GENERATION RUNNING (<u>0</u> HRS)	KW	0	0	3,461.11
PLANT LOAD FACTOR - (AVG. GEN. FOR MONTH/MAX. LOAD)	%	0	0	18.46

AUXILIARY STEAM SUPPLY - NUCLEAR

STEAM SUPPLIED BY REACTOR	HRS.	0	0	19,259.74
RWDF EVAPORATOR OPERATION	HRS.	45.68	690.97	8,105.83

* REMARKS: _____

AVERAGE REACTOR POWER - MW

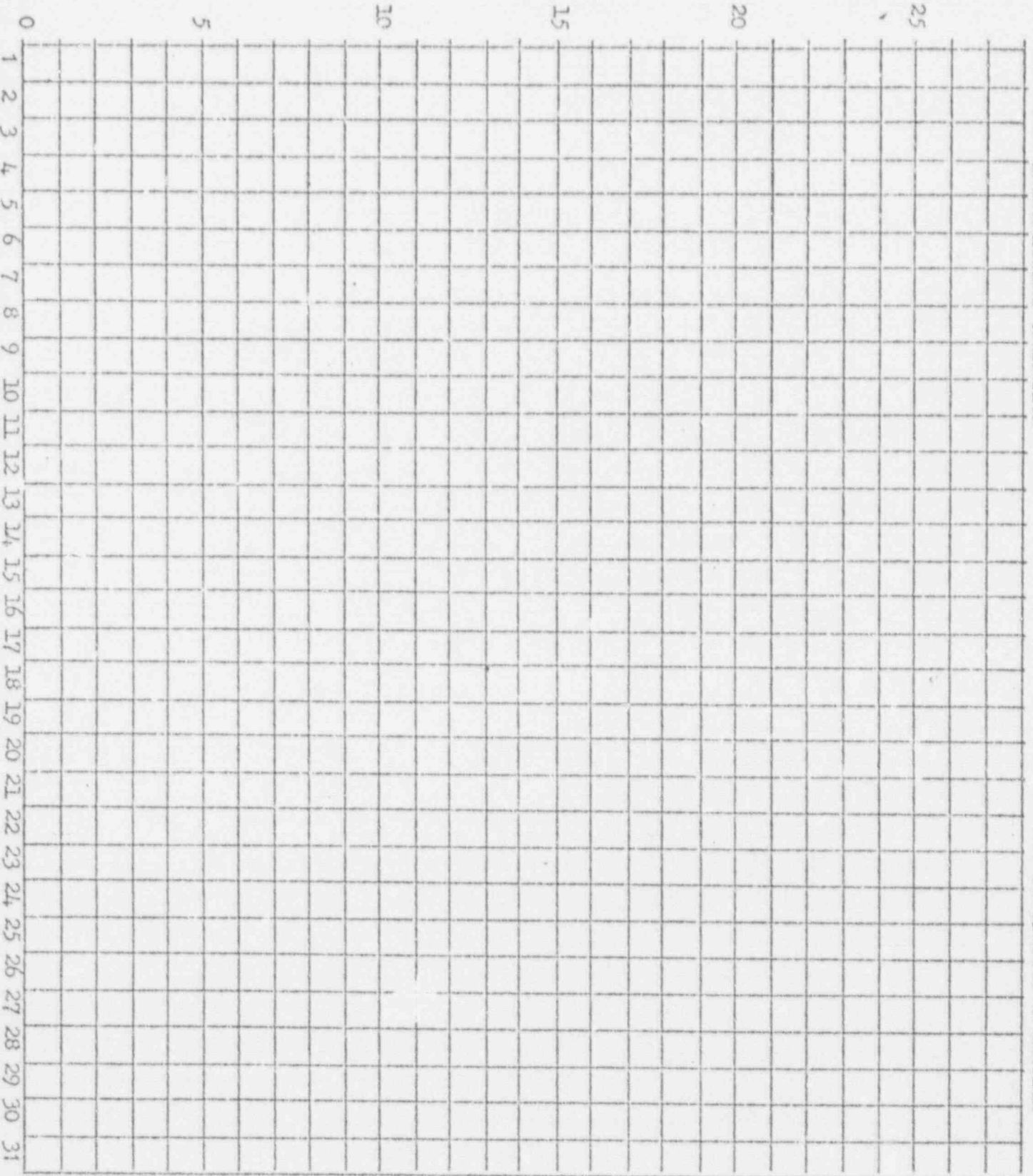
(UPPER CURVE)

SAXTON NUCLEAR EXPERIMENTAL CORPORATION

DAILY AVERAGE POWER LEVEL, FOR June, 1969

--- INTERMITTENT OPERATION

— CONTINUOUS OPERATION



AVERAGE ELECTRICAL POWER (GROSS) - MW

(LOWER CURVE)