

SANTON NUCLEAR EXPERIMENTAL CORPORATION

Operations Report for December 1968

1. GENERAL

The scheduled plant outage which was begun on October 18, 1968, was continued throughout this report period. The major effort during this period consisted of preparation of the main coolant system for inspection and installation of the recirculation system.

The reactor vessel head bolts were cleaned and sandblasted for inspection by the "MagnaFlo" method.

An underwater television camera with a remote screen was used to inspect the reactor internals with limited success.

The installation of the check valves in the safety injection system was completed on December 3. Work continued on the installation of the recirculation system piping both in the auxiliary compartment and in the storage well. The recirculation pumps were received on site on December 31.

Flanges were installed on the pressurizer spray line to enable installation of new gaskets on the pressurizer spray flange. The pressurizer safety valve manifold, incorporating a loop seal, was installed and welded to the pressurizer.

2. EXPERIMENTAL PROGRAM

The Data Acquisition System arrived on site and was installed in the Westinghouse experimental room. A control panel was built for the new flux detector system being installed for Core III.

3. OPERATIONAL TESTS

The SNDC fire and evacuation alarms were tested on December 6, 13, 20 and 27.

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

4. MAINTENANCE

The principal items of mechanical maintenance during the month included preparation of the main coolant piping for inspection; removal and disassembly of the pressurizer safety valves; rotating the main coolant pump; cleaning and wire brushing the reactor vessel head and head bolt can; painting the head bolt can with primer; replacing the manway and handhole on the steam generator secondary side; repairing the fork lift truck; painting the component cooling heat exchanger; disassembling the charging system check valve for repairs; installing a new head on the sewage treatment plant chlorine pump; processing eight drums of radioactive waste; water proofing and painting the insulation on the monitor tank and discharge tank piping; repairing the steam coils in the containment vessel inlet air handler; insulating the safety injection outdoor piping; replacing belts on the RWDF exhaust fan; sandblasting the reactor vessel heat bolts; rotating the main coolant pump rotor manually; and lowering the instrument frame into the upper core barrel.

The major items of electrical and instrument maintenance included calibration of the monitor tank level indicators; replacing the G-M tube in the count room beta counter; calibration of the evaporator level controller; checking the specific gravity of the station service batteries; repairing the containment vessel labitron; repairing the containment vessel particulate filter feed alarm circuit; repairing the chart drive on the start-up recorder; cleaning and recoating the containment vessel dewcel; installing gaskets in the process instrumentation d/p cells and sealing the electrical penetrations on the pressure transmitters; repairing the liquid scintillation spectrometer timer circuit; calibration of the RWDF hydrogen analyzer; meggering the two source range nuclear instrumentation channels; cleaning and repairing the regulating valve on the RWDF tank annulus bubbler; replacing the carbon vanes in the portable alpha monitor pump; and replacing electronic tubes in the radiation monitoring recorder amplifier.

5. CHEMISTRY

The main coolant system was in a cold shutdown condition throughout the entire month with the core transferred to the fuel storage rack. The main coolant was mixed with the storage well water. A summary of the analyses performed on the storage well during the month is given in the table below:

<u>Storage Well Samples</u>	<u>Minimum</u>	<u>Maximum</u>
pH at 25°C	5.10	5.39
Conductivity, umhos	5.89	6.72
Boron, ppm	1063	1898
Chlorides, ppm	< 0.005	< 0.005
Gross Beta-Gamma (15 Min. Degassed) uc/cc	1.01×10^{-3}	2.83×10^{-3}
Tritium, uc/cc	1.10×10^{-2}	1.20×10^{-2}

A component cooling system sample analyzed had a pH of 8.82 and conductivity of 1120 umhos. The chromate concentration was 435 ppm and the gross beta-gamma activity was 1.49×10^{-5} uc/cc.

6. RADIATION AND WASTE DISPOSAL

Radiation surveying consisted of routine plant surveys, C.V. during shutdown 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)	1.7 mrem/hr beta-gamma
Charging Pump (contact with chamber)	25 mrem/hr beta-gamma
Sample Room (door of sample panel)	1.2 mrem/hr beta-gamma
Chemical Lab Hot Sink (1" from drain)	4.7 mrem/hr beta-gamma
<u>RWDF</u>	
Evaporator (under bottom)	12 mrem/hr beta-gamma
Evaporator (contact outside upper level)	7 mrem/hr beta-gamma
Drum Storage Area (at HRA fence)	5.0 mrem/hr beta-gamma
<u>C.V.</u>	
Primary Compartment (general upper level)	120 mrem/hr beta-gamma
Primary Compartment (contact MC pump volute)	1100 mrem/hr beta-gamma
Primary Compartment (S.G. bottom)	350 mrem/hr beta-gamma
Primary Compartment (pressurizer bottom)	110 mrem/hr beta-gamma
Primary Compartment (general lower level)	50 mrem/hr beta-gamma
Primary Compartment (Regen. HX)	300 mrem/hr beta-gamma
Primary Compartment (Non-Regen. HX)	10 mrem/hr beta-gamma
Auxiliary Equip. Compt. (S.C.H.X.)	6 mrem/hr beta-gamma
Auxiliary Equip. Compt. (D.T. top)	10 mrem/hr beta-gamma
Auxiliary Equip. Compt. (D.T. bottom)	30 mrem/hr beta-gamma
Auxiliary Equip. Compt. (general lower level)	3 mrem/hr beta-gamma
Reactor Deck (water level at grating)	600 mrem/hr beta-gamma
Reactor Deck (waist level)	650 mrem/hr beta-gamma
Reactor Deck (storage well railing)	600 mrem/hr beta-gamma
Instrument Frame	2500 mrem/hr beta-gamma
Reactor Vessel (defueled)	750 mrem/hr beta-gamma

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Contamination surveying consisted of routine plant site surveys, surveys of materials shipped, tools, equipment and C.V. during shutdown. 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 levels were observed:

<u>Location</u>	<u>Contamination Reading</u>
<u>C&A Building</u>	
Charging Pump Chamber	20400 d/m/smear beta-gamma
Charging Pump Chamber	< 10 d/m/smear alpha
Charging Room Floor	693 d/m/smear beta-gamma
Sample Room Sink	80700 d/m/smear beta-gamma
Sample Room Sink	< 10 d/m/smear alpha
Sample Room Floor	554 d/m/smear beta-gamma
Chemical Lab Hot Sink	777 d/m/smear beta-gamma
Chemical Lab Hot Sink	< 10 d/m/smear alpha
<u>R&WDF</u>	
Shipping Room Floor	< 100 d/m/smear beta-gamma
<u>C.V.</u>	
Operating Deck	5250 d/m/smear beta-gamma
Operating Deck	< 10 d/m/smear alpha
Reactor Deck (head)	45100 d/m/smear beta-gamma
Reactor Deck (head)	< 10 d/m/smear alpha
Primary Compartment (grating)	2890 d/m/smear beta-gamma
Primary Compartment (grating)	< 10 d/m/smear alpha

Liquid and gaseous effluents from the SNEC site for the month of December, 1968, 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	0.000255	0.009276	0.009276
Tritium	0.120000	7.689117	7.689117 *
Air, Xe	0.000507	18.598902	18.598902
Air, I-131	0.000000	0.000494	0.000494
Air, M.F.P.	0.000005	0.185989	0.185989

* Contains a 0.193 curie correction for August 1968

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Three barrels of waste were drummed for temporary storage. No drums were shipped from the site.

Radiation exposures for all SNEC personnel as measured by film badges for the month of November 1968 were a maximum of 525 mrem with an average of 123.4 mrem.

Radiation exposures for all visiting personnel as measured by film badges for the month of November 1968 were a maximum of 46 mrem with an average of 1.5 mrem.

The average radiation exposure for all personnel as measured by film badges for the month of November 1968 was 82.5 mrem.

SAXTON NUCLEAR EXPERIMENTAL CORPORATION

OPERATING STATISTICS

MONTH DECEMBER YEAR 1968

<u>NUCLEAR</u>	<u>UNIT</u>	<u>MONTH</u>	<u>YEAR</u>	<u>TO DATE</u>
TIMES CRITICAL	NO.	0	281	823
HOURS CRITICAL	HRS.	0	2,375.49	22,948.49
TIMES SCRAMMED (MANUAL)	NO.	0	122	449
* TIMES SCRAMMED (INADVERTANT)	NO.	0	11	42
THERMAL POWER GENERATION	MWH	0	51,389.92	429,359.85
AVERAGE BURNUP	MWD/MTU	0	4,194.80	18,029.03
CONTROL ROD POSITIONS AT END OF MONTH AT EQUILIBRIUM POWER OF <u>0</u> Mwt				
MAIN COOLANT BORON <u> </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	9,149.8	72,426.3
STATION SERVICE	MWH	94.75	2,957.50	15,173.40
STATION SERVICE	%	0	31.29	20.81
AVG. PLANT EFFICIENCY - MWH(e)/MWH(t)	%	0	17.80	16.67
AVG. GENERATION RUNNING (<u>0</u> HRS)	KW	0	4,451.85	3,461.11
PLANT LOAD FACTOR - (AVG. GEN. FOR MONTH/MAX. LOAD)	%	0	16.53	19.52

AUXILIARY STEAM SUPPLY - NUCLEAR

STEAM SUPPLIED BY REACTOR	HRS.	0	2,108.65	19,259.74
RWDF EVAPORATOR OPERATION	HRS.	196.5	856.46	7,411.86

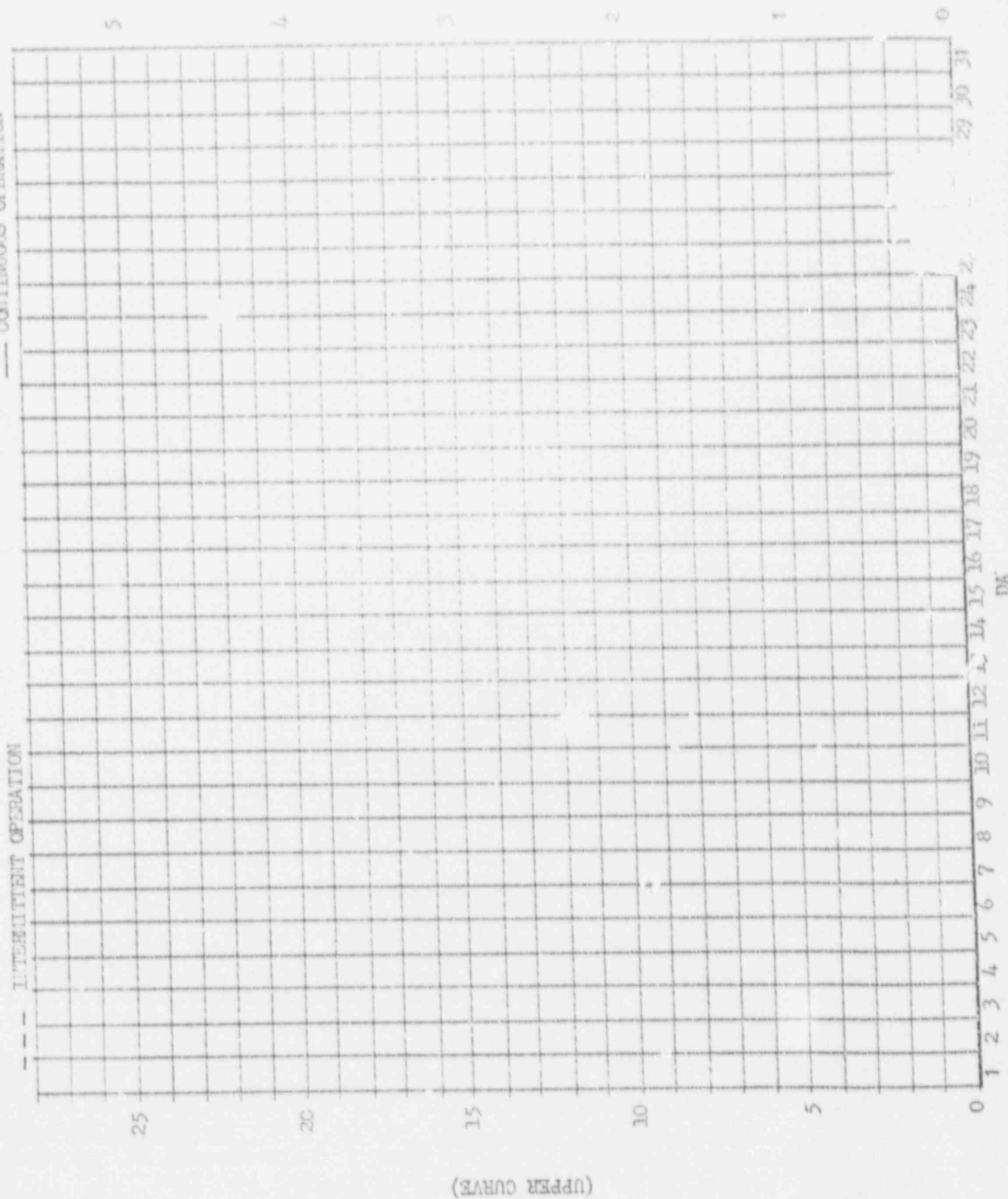
* REMARKS: _____

SAXTON NUCLEAR EXPERIMENTAL CORPORATION

DAILY AVERAGE POWER LEVELS OR December, 1968

--- CONTINUOUS OPERATION

--- INTERMITTENT OPERATION



AVERAGE REACTOR POWER - MW

(UPPER CURVE)

AVERAGE ELECTRICAL POWER (GROSS) - MW

(LOWER CURVE)