

SAXTON NUCLEAR EXPERIMENTAL CORPORATION

Operation Report for September 1964

1. REACTOR OPERATIONS

The reactor was operated at full power during the entire month of September in continuation of the chemical shim program and the defected fuel rods experiment. The main coolant system boron concentration was reduced from 640 ppm to 521 ppm during the month to compensate for fuel depletion.

2. EXPERIMENTAL PROGRAM

Depletion data and flux wire data were obtained during the month. The defected fuel rod cladding test was continued throughout the month. The purification system demineralizer was operated for 12 hours at approximately 11 gpm to help in evaluating the fission product release from the defected fuel rods. A successful test run was made with two miniature in-core detectors connected to the flux wire drives.

3. OPERATIONAL TESTS

On September 15 a normal test on the safety injection system was conducted.

The radiation monitoring system circuits were tested on September 16th.

4. MAINTENANCE

The principal items of mechanical maintenance for the month included the repair of two brass check valves on the RWDF tank annuli bubbler manometers; cleaning the control and auxiliary building intake air handler and associated duct work; repacking the three plungers on No. 1 charging pump; cleaning the check valve in the line from the RWDF No. 2 liquid storage tank to the gas compressor suction manifold; processing of six drums of radioactive evaporator concentrates; repair of the gland flange and repacking the control and auxiliary building heating steam shut-off valve; interchanging two $\frac{1}{2}$ " diaphragm valves on RWDF gas decay tank No. 3; repair of a leak in a connection in the sample panel; and the completion of an enclosure for the C&A building air intake filter.

The principal items of electrical maintenance included the installation of a new bottom flange on the acid flow meter in the make-up water treating system; measuring the underground piping cathodic protection system voltages; repair of a CP-3 (Cable Pile) radiation survey instrument; repair of the alpha scaler in the count room; repair of two leaky solenoid valves on the spent resin storage tanks; checking and calibrating the turbine inlet steam pressure transmitter; removing a defective compressor from the control room air conditioner; repairing the paging phone in the monitor room; replacing the bearing and coupling on RIC-8 radiation monitor air pump; cleaning and lubricating the chart drive mechanism on the source-intermediate flux recorder; replacing a defective solenoid in radiation monitor channel RIC-1 and the calibration of the containment vessel pressure transmitter and recorder.

5. PLANT CHANGES

A liquid level sight glass was installed on the RWDF gas compressor suction manifold.

PLANT CHANGES (Continued)

A flow meter was installed in the process liquid inlet line to the RWDF evaporator.

A liquid level sight glass was installed on the RWDF evaporator.

A three-way solenoid valve was installed in the discharge line of the RWDF evaporator hotwell pump. The valve functions to dump the water in the hotwell to the radioactive water drain system in the event of radioactive carry-over from the evaporator.

6. CHEMISTRY

The main coolant system was maintained at operating conditions throughout this report period. The main coolant boron concentration was adjusted in accordance with the chemical shim program. On September 4th the boron was reduced from 641 ppm to 608 ppm, on September 15th to 548 ppm, and on September 24 to 521 ppm. The purification demineralizer was placed in service on September 24th for 12 hours. After 5 hours of operation the main coolant 15 minute activity (gross beta-gamma) was reduced from 0.669 uc/cc to 0.346 uc/cc. The main coolant total alkali (M/L x 10⁻⁴) increased from 1.188 to 1.856 during this period. A summary of the main coolant chemistry analyses made during the month are contained in the following table:

<u>Main Coolant System</u>	<u>Minimum</u>	<u>Maximum</u>
Conductivity, umhos	14.20	22.60
Boron, ppm	519	641
Lithium, ppm	.06	.455
Potassium, ppm	2.10	7.10
Chlorides, ppm	.010	.040
Oxygen, ppm	<.005	<.005
Hydrogen, cc/KgH ₂ O	39.02	62.40
Crud, ppm	.040	.079
15 Min. Gross Beta-Gamma, uc/cc	.346	.853

Steam generator chlorides were maintained below 0.170 ppm with a constant blowdown rate of 1000 lbs/hour. The average activity of the steam generator blowdown continued to be less than 1×10^{-8} uc/cc.

7. RADIATION AND WASTE DISPOSAL

Radiation surveying consisted of routine plant site surveys, RWDF, waste storage area, shipment of radioactive material samples, and waste drums prior to and after mixing. The following maximum readings were taken:

<u>Location</u>	<u>Radiation Reading</u>
<u>C&A Building</u>	
Charging Pump (contact with chamber)	16.0 mrem/hr beta-gamma
Sample Room (at door of panel)	3.5 mrem/hr beta-gamma
Waste Drum (contact)	90.0 mrem/hr beta-gamma
Chemical Lab Hot Sink (1" from drain)	0.45 mrem/hr beta-gamma
Dumbwaiter (contact door)	2.0 mrem/hr beta-gamma

RADIATION AND WASTE DISPOSAL (Continued)

<u>Location</u>	<u>Radiation Reading</u>
<u>RWDF</u>	
Evaporator (under bottom)	160 mrem/hr beta-gamma
Evaporator (contact outside upper level)	100 mrem/hr beta-gamma
Evaporator Room (preheater)	9.0 mrem/hr beta-gamma
Concentrates Room (drums prior to mixing)	800 mrem/hr beta-gamma
Concentrates Room (grating)	20 mrem/hr beta-gamma
<u>Yard Area & Misc.</u>	
Fence (around C.V.)	0.3 mrem/hr beta-gamma
C.V. Exhaust Filter (contact outside)	2.35 mrem/hr beta-gamma
C.V. Exhaust Filter (contact inside)	4.0 mrem/hr beta-gamma
Resin Storage Tank #2 (contact in manway)	4.5 mrem/hr beta-gamma
Equipment Access Door (contact)	4.5 mrem/hr beta-gamma
RWST	0.45 mrem/hr beta-gamma
Evaporator Concentrates Drum (after mix-contact)	85.0 mrem/hr beta-gamma
Evaporator Concentrates Drum (after mix-1 meter)	6.5 mrem/hr beta-gamma
Drum Storage Area (at HRA fence)	11.5 mrem/hr beta-gamma
Drum Storage Area (at boundary fence)	0.12 mrem/hr beta-gamma
Shipment of Radioactive Samples (contact)	12.0 mrem/hr beta-gamma

Contamination surveying consisted of routine plant site surveys, surveys of RWDF, pipe tunnel, shipment of radioactive material samples, and tools. The clean and controlled areas were generally within the "Clean Area" limits with the exception of permanent exclusion areas. All areas were cleaned periodically to minimize the amount of smearable contamination. The following contamination readings were taken:

<u>Location</u>	<u>Contamination Reading</u>
<u>RWDF</u>	
Pump Room	1870 d/m/smear beta-gamma
Evaporator Room	430 d/m/smear beta-gamma
Concentrates Room	1880 d/m/smear beta-gamma
Evaporator Concentrates Drum (before wash)	3000 d/m/smear beta-gamma
<u>C&A Building</u>	
Charging Pump Chamber	102640 d/m/smear beta-gamma
Charging Room Floor	31080 d/m/smear beta-gamma
Sample Room Sink	3300 d/m/smear beta-gamma
Sample Room Floor	7700 d/m/smear beta-gamma
Chemical Lab Hot Sink	71000 d/m/smear beta-gamma
Pipe Tunnel (under sample panel area)	500 d/m/smear beta-gamma

ATTN: Operation Report for
September 1964 #4

RADIATION AND WASTE DISPOSAL (Continued)

Liquid and gaseous activity effluents from the SNEC site for the month of September were as follows:

<u>Effluent Type</u>	(Curie) Activity <u>This Month</u>	(Curie) Calendar <u>Year to Date</u>	(Curie) Last <u>Twelve Months</u>
Liquid	0.000729	0.019338	0.020066
Air, Xe	0.304857	0.304857	0.304857
Air, I-131	< 0.000019	< 0.000019	< 0.000019
Air, M.F.P.	0.003049	37.387899	64.434050

Six barrels of waste were drummed for temporary storage and no waste was shipped from the site.

Radiation exposure for all personnel as measured by film badges for the month of August 1964 were a maximum of 80.0 mrem with an average of 9.4 mrem.

SAXTON NUCLEAR EXPERIMENTAL CORPORATION

OPERATING STATISTICS

MONTH September YEAR 1964

<u>NUCLEAR</u>	<u>UNIT</u>	<u>MONTH</u>	<u>YEAR</u>	<u>TO DATE</u>
TIMES CRITICAL	NO.	0	28	265
HOURS CRITICAL	HRS.	720	2,954.05	9,694.01
TIMES SCRAMMED (MANUAL)	NO.	0	23	206
* TIMES SCRAMMED (INADVERTANT)	NO.	0	5	24
THERMAL POWER GENERATION	MWH	16,848	56,037.58	157,039.06
AVERAGE BURNUP	MWD/MTU	804.92	1,904.67	6,977.25
CONTROL ROD POSITIONS AT END OF MONTH AT EQUILIBRIUM POWER OF <u>23.4</u> MWt				
MAIN COOLANT BORON <u>521</u> PPM				

RODS OUT - INCHES

NO. 1 <u>40</u>	NO. 2 <u>40</u>	NO. 3 <u>40</u>
NO. 4 <u>40</u>	NO. 5 <u>27.85</u>	NO. 6 <u>40</u>

<u>ELECTRICAL</u>	<u>UNIT</u>	<u>MONTH</u>	<u>YEAR</u>	<u>TO DATE</u>
GROSS GENERATION	MWH	2,914.00	9,535.00	26,305.00
STATION SERVICE	MWH	222.62	1,681.74	5,953.01
STATION SERVICE	%	7.64	17.64	22.63
AVG. PLANT EFFICIENCY - MWH(e)/MWH(t)	%	17.30	17.01	16.75
AVG. GENERATION RUNNING (<u>720</u> HRS)	KW	4,050	3,660	3,370
PLANT LOAD FACTOR - (AVG. GEN. FOR MONTH/MAX. LOAD)	%	94.4	33.8	27.8

AUXILIARY STEAM SUPPLY - NUCLEAR

STEAM SUPPLIED BY REACTOR	HRS.	720	2,619.15	7,744.85
HWDF EVAPORATOR OPERATION	HRS.	128	615.15	15,588.00

* REMARKS: _____



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OPERATING EXPERIENCE REPORT

for the period
September 1, 1964 - February 28, 1965