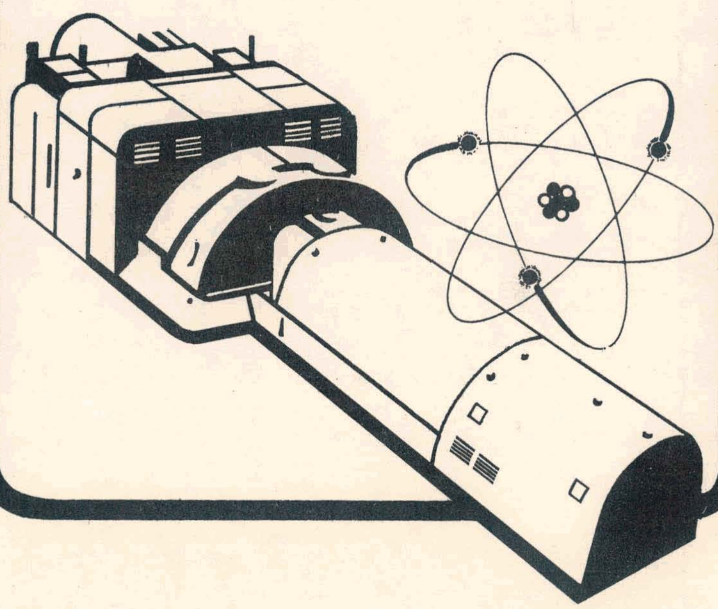
DLCS 5000172

DUQUESNE LIGHT COMPANY

Shippingport Atomic Power Station

Quarterly

OPERATING REPORT



First Quarter 1972

Contract AT-11-1-292

United States Atomic Energy Commission

DISCLAIMER

QUARTERLY OPERATING REPORT
First Quarter 1972
DLCS 5000172

Approved by F. J. Bissert
Superintendent

Contract AT-11-1-292
United States Atomic Energy Commission

TABLE OF CONTENTS

Preface

This Quarterly Report is prepared and issued by the Duquesne Light Company to disseminate information relative to all significant activities conducted at the Shippingport Atomic Power Station. Consistent with the premise that Shippingport was built to provide information and not power at competitive costs, this report makes no effort to analyze power production costs and makes no deductions regarding costs which might be achieved if Shippingport had been built and operated solely to produce power.

In preparation of these reports, it has been presumed that the reader has a working knowledge of nuclear reactors, reactor technology and/or electric utility generating station operations. The reader is reminded, however, that this is an operating report rather than a technical report. Anyone desirous of obtaining advice on recent technical progress related to the nuclear portion of the Shippingport Atomic Power Station is therefore referred to the United States Atomic Energy Commission, Office of Technical Information Extension at Oak Ridge, Tennessee, where this information is readily available.

1. SUMMARY OF OPERATIONS

During the first quarter of 1972, the Shippingport Atomic Power Station was operated for Duquesne Light Company system load demand, testing, and maintenance. The Heat Dissipation System remained shutdown throughout the period.

At the beginning of the period, the 1B, 1C, and 1D Reactor Coolant Loops were in service. The 1A Loop was isolated and drained throughout the period for heat exchanger tube repairs.

On February 26, the semi-annual station shutdown was undertaken for testing, maintenance, and operations' checks. The Core Removal Cooling System was initiated on March 1, 1972 with the primary coolant temperature approximately 175° F. Loss of AC power casualty drills were performed twice during the outage.

On February 27, high conductivity in the Hotwell was detected by Chemistry. The cause was found to be a change in the conductivity of the building heat condensate returns to the Drip Tank which was connected to the Main Unit Condenser. The Drip Tank was then routed to the sewer until the problem was corrected.

On March 5, 1972, a leak test of the Radioactive Waste Disposal gas system was conducted. The system integrity was found to be excellent, and no measurable leakage was found.

The Station was back on the line at 11:01 A.M. on March 20. At 11:08 A.M., Group II and III control rods were bottomed by a partial scram from the power-to-flow circuitry of the Nuclear Protection System. The installation of new poly in the CIC detectors and insertion of high gains in the Nuclear Protection System resulted in high sensitivity in the system. A pre-critical was initiated, and the Main Unit Generator was back on the line at 4:34 P.M. of the same day.

The BD Purification System was removed from service and drained on March 17 for the relief valve installation. On March 19, the BD Purification was returned to service.

During the first quarter period, there were no shipments of radioactive waste for burial.

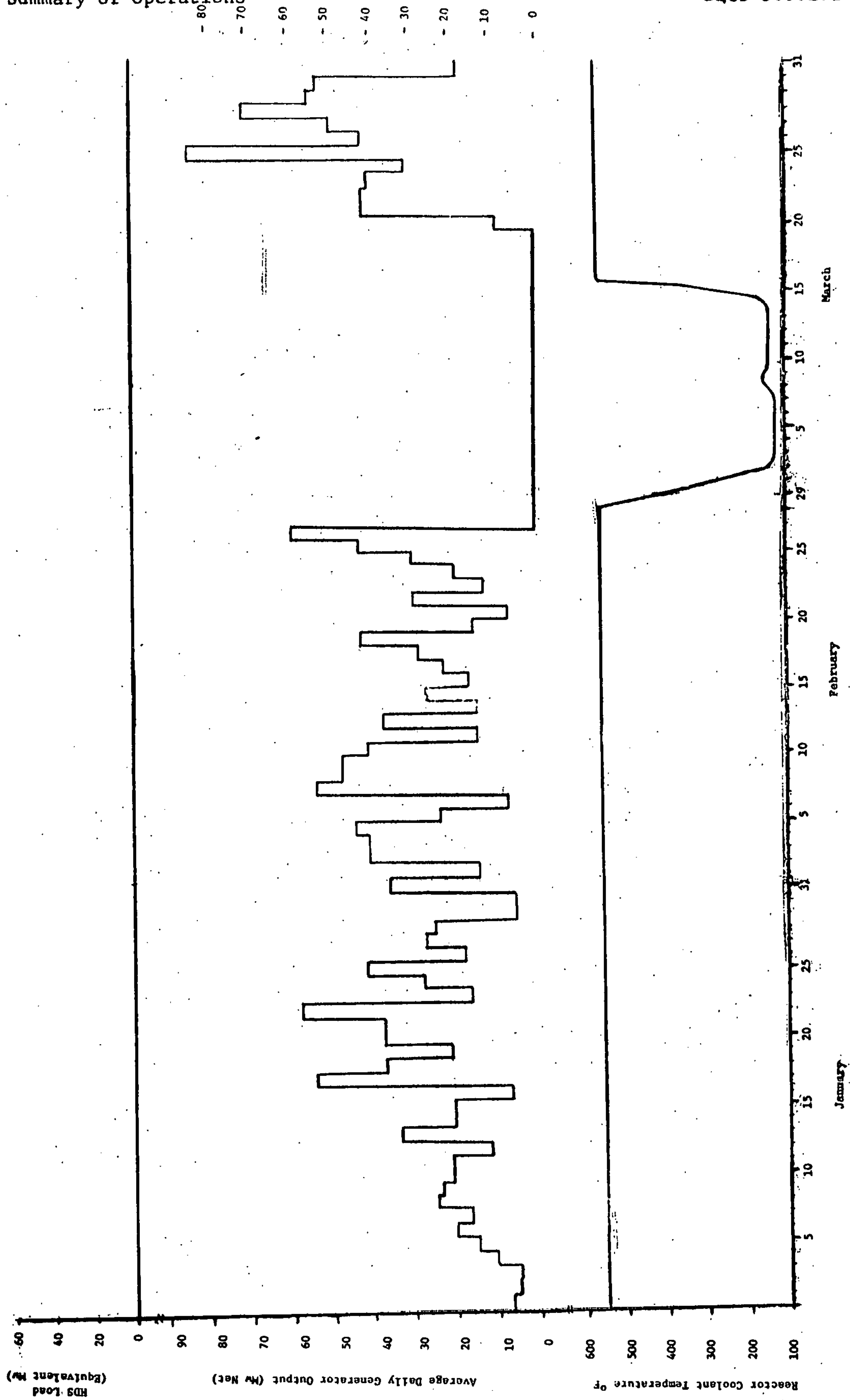


FIGURE I
Generator Output, HDS Load and Reactor Coolant Temperature During First Quarter Period

2. SUMMARY OF CORE 2 STATION PERFORMANCE

Electrical output (Gross) to date	kwhr	2,984,923,300
EFPH to date (Blanket operating time)	hr	20,553.6
EFPH to date (Seed 2 Operating time).	hr	6,901.6
EFPH for the quarterly period	hr	406.4
Hours reactor critical to date	hr	48,450.6
Hours reactor critical for the quarterly period	hr	1,650.2
No. 1 main unit service hours (quarterly period).	hr	1,637.9
Net Station output (quarterly period)	kwhr	45,756,000
No. of forced outages*		1

* Interruption of electrical output due to protective relay action and/or operator action as required to protect the Station.

3. CHEMISTRY

During the first quarter of 1972 the chemistry section maintained specifications in the various plant systems and fulfilled station manual requirements.

Reactor Plant

During the entire first quarter the station operated using the 1B, 1C, and 1D reactor coolant loops and the BD purification demineralizer. The AC purification demineralizer was put in service for a one day period during a station shutdown so that the BD purification demineralizer could be taken out of service for maintenance. There were no out of specification reactor coolant conditions during this period. See Tables I and II for a summary of reactor coolant conditions during operation and shutdown.

The primary storage tank water had a high pH and high specific conductivity throughout the first third of the quarter. This condition was attributed to ammonium hydroxide (NH_4OH) in the tank. As water was added to the tank during the quarter, the ammonium hydroxide concentration decreased and the charging water reached specifications. The remainder of the reactor plant auxiliary systems were maintained within chemical specifications except for the component cooling water system which had a low chromate concentration. This was due to a drain down of the system for maintenance and then refilling. Chemical treatment corrected the condition. See Table III for further information.

The Cs^{138} activity of the reactor coolant remained relatively constant during this quarter. All values are corrected to a standard base of 67% reactor power, four (4) reactor coolant loops in service, two (2) purification demineralizers in service at full flow, and 536° F. Tavg operation.

Average Cs^{138} Activity

Month	dpm/ml	μCi/ml	No. of Observations
January	608	2.77×10^{-4}	8
February	515	2.34×10^{-4}	6
March	533	2.43×10^{-4}	4

The monthly crud samples had a specific activity ranging from 2.12×10^7 cpm/mg to 3.59×10^7 cpm/mg after a 120 hr. decay and a concentration range of 1.07 to 2.63 ppb. The gross non-volatile gamma activity of the reactor coolant after a 15 minute decay ranged from 7,016 cpm/ml at 11% reactor power to 53,993 cpm/ml at 60% reactor power. The D.F. (decontamination factor) across the demineralizers ranged from 231 to 686 after a 15 minute decay.

As required by the station manual, radiochemical analysis of reactor coolant for soluble and insoluble activity is performed each 1,000 EFPH. Samples for the seventh performance of this requirement were collected on 2-2-72 to 2-4-72. Detectable amounts of Cs^{134} and Cs^{137} were observed in the coolant for the first time during Core 2 Seed 2 operation. See Tables IV and V.

Turbine Plant

During the entire first quarter the station operated on volatile heat exchanger chemistry. The 1B, 1C, and 1D heat exchangers were in service throughout the quarter. The 1A heat exchanger remained drained throughout the quarter for repairs. There were two out of specification operating heat exchanger conditions. One condition was a low pH which resulted from a defective condensate chemical addition pump. This out of specification condition was remedied by treating the heat exchangers directly with morpholine (C_4H_9NO) and having the condensate chemical addition pump repaired. The other out of specification condition was high specific conductivity (above 10 micromhos/cm) for the 1B and 1C heat exchangers. The condition was remedied by "blowing down" the heat exchangers.

Two out of specification conditions were experienced during lay-up. One out of specification condition was a low pH for the heat exchangers. This condition was due to the lack of chemical treatment as the heat exchanger feed pumps were not operating. Also, for temperature control, the heat exchangers were filled with cold oxygenated water (from the primary water storage tank) which reacted with the hydrazine (N_2H_4) which was present. Direct treatment with morpholine (C_4H_9NO) remedied this condition. The other out of specification condition was a high chloride concentration in the 1B and 1D heat exchangers. This condition was attributed to a "slug" of water with a high chloride concentration from the building heat return system. Heat exchanger "blowdowns" remedied the situation.

During a cold lay-up period, out of specification heat exchanger hydrazine (N_2H_4) concentrations were experienced. The high concentration values in the 1B and 1D heat exchangers resulted from insufficient mixing prior to sampling. The hydrazine concentration normally decreases with time and the below minimum out of specification conditions were corrected through treatment. See Tables VI, VII, VIII for a summary of heat exchanger water conditions.

Radioactive Waste Disposal System

The radioactive waste disposal system continued to operate using a series of fixed ion exchange media which was initiated during the first quarter of 1971. During this quarter a Radioactive Waste Disposal Biocide Program was inaugurated. In order to achieve better counting geometry and statistics a new scintillation counter was put in service. This counter consists of a 2" x 2" sodium iodide-thallium activated crystal in its own cave with associated equipment.

Xe^{133} activity for the quarter was approximately (5) five times higher than for the previous quarter. The activity ranged from 2.41 dpm/cc to 1.13×10^{2} dpm/cc (1.10×10^{-6} μCi/cc to 5.14×10^{-5} μCi/cc). This increase was attributed to increased degassing venting of the blowoff tank prior to the station shutdown.

TABLE I

Reactor Coolant System

Water Conditions and Chemical Adjustments

<u>Operating Conditions</u>

Chemical Condition	Specifications	Analytical Results Min.	Analytical Results Max.	NH_4OH Additions Liters	Degassification Hours
1. pH @ 25° C	10.20 ± 0.10	10.11	10.30	120.7	83.75
2. Specific Conductivity μmhos	- - -	34	51		
3. Total Gas - cc/kg	125 Maximum	57	106		
4. Hydrogen - cc/kg	10 - 60	29	55		

TABLE II

Reactor Coolant System

Water Conditions and Chemical Adjustments

Shutdown Conditions

Chemical Conditions	Temp.	Specifications	Analytical Results Min.	Analytical Results Max.	NH_4OH Additions Liters	H_2 Addition cu. ft.
1. pH @ 25° C	> 200°F	10.10 - 10.30	10.12	10.28	12.5	0
	< 200°F	6.0 - 10.50	9.31	10.17	0	164
2. Total Gas - cc/kg	> 200°F	80 Max.	16	54		
	< 200°F	25 Max.*	-	-		
3. Hydrogen - cc/kg	> 200°F	10 - 60	10	36		
	< 200°F		-	-		
4. Oxygen - ppm	> 200°F	< 0.14	0.005	0.015		
	< 200°F	< 0.3	0.005	0.010		
5. Chloride - ppm	> 200°F	< 0.1	< 0.05	< 0.05		
	< 200°F	< 0.1	< 0.05	< 0.05		

* Degassification to 25 cc/kg must be accomplished prior to reducing reactor coolant pressure below the minimum required for reactor coolant pump operation.

TABLE III

Reactor Plant Auxiliary Systems

Water Conditions

System	Specific Conductivity µmhos	pH at 25° C	Conc. - ppm			Gross Gamma* Activity-dpm/ml
			CrO_4	Cl	Dis. O_2	
Component Cooling						
Specifications	none	8.30-10.50	500-1000	1 ppm max.	none	none
Observed	940-1350	9.30-9.90	426-689	0.10-0.30	--	Bkgd.
Coolant Charging Water						
Specifications	2.50 max.	6.00-8.00	none	0.1 ppm max.	none**	none
Observed	1.12-5.60	6.80-9.13	-	<0.05	8.8-10.3	-
Canal Water						
Specifications	5.00 max.	6.00-8.00	none	none	none	none***
Observed	0.97-1.70	6.47-6.48	-	-	--	Bkgd. - 9 ± 8

* Multiply tabular value by 4.55×10^{-7} to obtain µc/ml
** Should be < 0.14 ppm for reactor plant cold shutdown
***Normally near background

TABLE IV

Primary System Resin and Crud Analysis

In Service EFPH	In Service Date	In Service Time	Out Service Date	Out Service Time	Type Sample	Volume Coolant Liters	Crud Weight mg.	Resin Weight gms.	Sp. Act.* cpm/mg @ 120 hrs.	Activity dpm/mg at 120 hr. ** Co^{60}	Co^{58}	Fe^{59}	Cr^{51}	Mn^{54}	Hf^{181}	Zr^{95}	% Acc
									$x10^7$	$x10^6$	$x10^6$	$x10^5$	$x10^5$	$x10^5$	$x10^3$	$x10^4$	
950	9/18/69	1400	9/19/69	1400	Crud	437	1.61		2.30	31.6	13.0	100	1.72	13.0	0.002	0.113	91
1690	12/08/69	1200	12/10/69	1200	Crud	873	1.78		2.64	31.2	31.2	24.1	39.4	13.9	1.56	15.5	96.7
2445	2/12/70	1000	2/13/70	1000	Crud	437	0.13		9.69	97.5	120	52.6	208	45.8	10.7	87.5	91.3
3814	8/25/70	0925	8/26/70	0925	Crud	437	2.25		2.67	37.7	22.8	11.8	39.0	14.6	1.5	4.1	94.1
4535	1/06/71	1320	1/07/71	1320	Crud	437	1.48		1.02	14.1	8.2	8.4	20.8	7.8	0.5	1.5	92.8
5746	6/16/71	0830	6/18/71	0830	Crud	874	3.72		3.51	23.9	58.4	10.1	82.3	10.5	2.16	8.73	90.8
6654	2/02/72	0830	2/04/72	0830	Crud	874	0.07		6.64	45.6	73.4	10.8	36.3	70.2	5.30	17.4	71.3
									cpm/gm @ 120 hr.	Activity dpm/gm at 120 hr. **							
									$x10^4$	$x10^4$	$x10^4$	$x10^3$	$x10^2$	$x10^3$			
950	9/18/69	1400	9/19/69	1400	Resin	219		50.1	17.0	6.79	4.08	1.77	1.89	1.07			25
1690	12/08/69	1200	12/10/69	1200	Resin	437		42.5	56.9	74.1	46.7	18.1	407	181			94.1
2445	2/12/70	1000	2/13/70	1000	Resin	129		42.7	29.4	32.0	15.4	11.0	47.4	162			67.2
3814	8/25/70	0925	8/26/70	0925	Resin	219		≈42.5	51.5	95.7	8.5	7.8	80	133			92.9
4535	1/06/71	1320	1/07/71	1320	Resin	219		43.5	16.0	12.1	5.3	15.7	Bkgd	103			64.2

* For conversion to the microcurie unit, multiply tabular value by 1.07×10^{-6}
** For conversion to the microcurie unit, multiply tabular value by 4.55×10^{-7}

TABLE V

1000 Hour Fission Product Analysis

1000 Hour (Run Number) and E.F.P.H.	Cs^{137} dpm/ml	Cs^{134} dpm/ml	I^{131} dpm/ml	I^{133} dpm/ml	Xe^{133} dpm/ml	Ar^{41} dpm/ml
(1) 950	non-dect.	non-dect.	4.2	1.04×10^{2}	29	1.43×10^{4}
(2) 1690	non-dect.	non-dect.	3.2	8.70×10^{1}	98	4.44×10^{4}
(3) 2445	non-dect.	non-dect.	5.2	7.60×10^{1}	84	3.37×10^{4}
(4) 3814	non-dect.	non-dect.	6.9	1.99×10^{2}	57	4.22×10^{4}
(5) 4535	non-dect.	non-dect.	3.8	4.70×10^{1}	47	4.71×10^{4}
(6) 5746	non-dect.	non-dect.	2.3	2.77×10^{1}	-	2.24×10^{4}
(7) 6654	3.12	2.51	22.4	1.46×10^{2}	277	2.77×10^{4}

Multiply above values by 4.55×10^{-7} to obtain µCi/ml

TABLE VI

Operating Heat Exchanger Chemistry

Volatile Water Chemistry

Water Conditions	Specifications	Heat Exchangers 1A	1B	1C	1D
1. Cond. - µmho	Min. ---- Max. 10		6.1 11.5*	5.4 10.7*	6.1 10.0
2. Phosphate - ppm	Min. ---- Max. 2		0 0.2	0 0.4	0 0.3
3. Chlorides - ppm	Min. ---- Max. 0.5		0.09 0.46	0.09 0.46	0.09 0.42
4. Hydrazine - ppm	(residual) Min. Max.		0.077 0.190	0.069 0.180	0.060 0.160
5. Silica - ppm	Min. ---- Max. 25		4.08 4.69	4.23 6.50	4.35 7.2
6. pH at 25° C	Min. 8.0 Max. ----		7.59* 8.99	7.50* 8.96	7.45* 9.03
7. Chemicals Used					
Na_3PO_4		--	--	--	--
Na_2HPO_4		--	--	--	--
NaH_2PO_4					
N_2H_4					
C_4H_9NO			1/2**	1/2**	1/2**

* See Page 5
** Added directly to heat exchangers

TABLE VII

Hot Lay-Up Heat Exchanger Chemistry

Volatile Water Chemistry

Water Conditions	Specifications	Heat Exchangers 1A	1B	1C	1D
1. Cond. - µmho	Min. ---- Max. 10		3.9 21.0**	4.1 40**	4.1 24**
2. Phosphate - ppm	Min. ---- Max. 2		- -	- -	- -
3. Chlorides - ppm	Min. ---- Max. 0.5		<0.05 0.62*	<0.05 0.47	<0.05 0.54*
4. Hydrazine - ppm	(residual)		.005 176	0.002 180	0.002 180
5. Silica - ppm	Min. ---- Max. 25		- -	- -	- -
6. pH at 25° C	Min. 8.0 Max. ----		7.59* 9.81	7.62* 9.60	7.85* 9.93
7. Chemicals Used					
Na_3PO_4		-	-	-	-
Na_2HPO_4		-	-	-	-
NaH_2PO_4					
N_2H_4					
C_4H_9NO			1 1/2***	1 1/2***	1 1/4***

* See Page 5 for explanation
** Due to steaming of heat exchangers from cold lay-up
*** Added directly to heat exchanger

TABLE VIII

Cold Lay-Up Heat Exchanger Chemistry

Volatile Water Chemistry

Water Conditions	Specifications	Heat Exchangers 1A	1B	1C	1D
1. Cond. - µmho	Min. ---- Max. ----		8.6 16.0	10.0 15.0	8.6 25
2. Phosphate - ppm	Min. ---- Max. 2		- -	- -	- -
3. Chlorides - ppm	Min. ---- Max. 0.5		< 0.05 0.20	< 0.05 0.22	< 0.05 0.20
4. Hydrazine - ppm	(residual) 50 100		22* 110*	52 99	22* 320*
5. Silica - ppm	Min. ---- Max. 25		- -	- -	- -
6. pH at 25° C	Min. 8.0 Max. ----		9.25 9.70	9.30 9.63	9.30 9.82
7. Chemicals Used					
Na_3PO_4		-	-	-	-
Na_2HPO_4		-	-	-	-
NaH_2PO_4		-	-	-	-
N_2H_4			42 1/3	35 1/3	42 1/3

* See Page 5 for explanation

DLCS 5000172

4. MAINTENANCE

Repairs of major components, as well as routine maintenance on equipment, instruments, controls and preventive maintenance were performed during the quarterly report period. Major components which were repaired during this report period are as follows:

1A Steam Generator

Repair of the 1A Steam Generator, which had been undertaken during the second quarter of 1971, continued throughout this quarter. The eddy current inspection of all tubes initiated during the past quarter was completed on February 7, 1972. A number of tube locations were then positively identified for further tube plugging operations as determined from results of the inspection. Work on the steam generator was suspended at the end of the quarter due to the previously scheduled semi-annual station shutdown.

1A Reactor Coolant Pump

With the continued outage of 1A Reactor Coolant Loop, the 1A Reactor Coolant Pump remained open to permit periodic manual pump rotation throughout the entire quarter.

Auxiliary Station Service Air Compressor

During the previous quarter the auxiliary station service air compressor was removed from service for inspection and preventive maintenance. A thorough inspection and overhaul was completed and the compressor made available for service.

RWD Evaporator

The RWD evaporator compressor was removed from service during the quarter due to a leak at the oil seals. It was then necessary to completely overhaul the compressor, plug one of the tubes in the auxiliary vent condenser, and replace the feed pump shaft and its mechanical seals. The evaporator was then returned to service.

Spring Station Shutdown Maintenance

1. PWR Pressurizer

   Permanent corrective actions were performed at five (5) Pressurizer Tank heater locations on March 6, 7, 11, and 12. New heaters were installed at two locations and three heaterwells were sealed with welded caps at the remaining locations.

2. Spare Valve Operating System Air Compressor

Preventive maintenance was performed on the spare VOS air compressor during the quarter. Compressor and component piping were cleaned and compressor made available for service.

3. Air Treatment 1B Hydraulic Oil Pump

The air treatment 1B hydraulic oil pump was overhauled during the spring shutdown.

4. AC and BD Purification Loops

Excessive leakage through the relief valves in both AC and BD purification loops resulted in replacing both valves. The rebuilt BD relief valve was also found defective and was isolated prior to return to power.

5. Relief Valves

Tested various relief valves throughout the Reactor Plant in accordance with preventive maintenance requirements.

6. Miscellaneous Valves

General valve inspection and maintenance was also performed on numerous valves during the shutdown.

5. TEST PROGRAM

The primary objective of the test program during the quarterly report period was to continue reactivity depletion of Core 2 Seed 2 in order to determine irradiation and reactivity lifetime properties and core power distribution as a function of lifetime. Other objectives for this period were to perform periodic calibrations of the Data Acquisition System and the primary plant temperature and flow instrumentation. Tests were also performed to check the operation of the FEDAL System, the Nuclear Protection System, and the Control Rod Drive Mechanisms. Radiation surveys were taken on the reactor coolant loops, reactor vessel head, and the purification demineralizers. The reactor plant container integrity was checked at the butterfly valves. A RWD leak determination test was also performed.

Eighteen test performances were conducted during the report period. Sixteen tests were completed and two remained in progress at the end of the quarter. Table IX lists these tests and Figure 2 indicates the performance dates.

The Periodic Intercalibration of Temperature Sensing Elements (DLCS 60901) was performed on February 27, March 1, 2, 5, 6, and 16-18, 1972. The temperature instrumentation for coolant loops 1B, 1C, and 1D were calibrated at this time; 1A coolant loop remained out of service during this testing period. The fourteenth performance of the Periodic Calibration of Reactor Plant Flow Instrumentation (DLCS 61301) was a calibration of the 1B, 1C, and 1D coolant loop flows performed on March 2, 3, and 4. Periodic Calibration of Pressurizer Level Instrumentation (DLCS 61201) was performed on March 4, 5, and 6 completing its eighth performance. On February 15 and 16, the pressurizer pressure (NR) was recalibrated and on March 7 and 8 the 1C coolant loop pressure was recalibrated to complete the eleventh performance of Periodic Calibration of Pressure Instrumentation (DLCS 61001).

Comparison of Reactor Plant Pressure Instrumentation at Operating Pressure and Temperature (DLCS 61002) was performed on February 29. The Data Acquisition System Calibration Test (DLCS 60401) was performed, during this quarter, in conjunction with all of the above instrument calibration tests.

The FEDAL System Checkout Test (DLCS 58201) was performed on February 8, 15, and 17, with both monitors responding satisfactorily to the count rate calibration. The FEDAL System Start-up Test (DLCS 58302) was performed monitoring seed assemblies E-5 and I-9, corresponding to port 13. Performance 84 and 85 were completed during this report period.

On February 27, Periodic Radiation Survey of the Reactor Vessel Head (DLCS 58601) and a radiation survey of the AC and BD Heat Exchangers and Demineralizers and the 1B, 1C, and 1D Reactor Coolant Loops (DLCS 58501) were taken. Results of both surveys showed no unusually high or abnormal radiation levels anywhere in the system.

The Reactor Plant Container Integrity Test (Butterfly Valve Test) (DLCS 56802) was performed on March 4, 5, and 6 completing the 15th performance of the test. Acceptable response times and leak rates were obtained for both the supply and exhaust valves.

On March 1-4, the eighth performance of Nuclear Protection System (Checkout of High Th and P/F Circuitry) (DLCS 60801) was performed. The response times of the master trip units were well within the 77 millisecond time limit for excessive P/F conditions. Also, the response times of the master trip units were well within the 110 millisecond time limit for high Th conditions. Nuclear Protection System (Checkout of Pump Power, SLOFA and CLOFA Circuitry) (DLCS 60802) was performed on March 17. Data collected from this eighth performance showed all response times to be within specified limits.

The first performance of (DLCS 63703) Control Rod Positions for Criticality at Operating Temperature was performed on March 19 and 20. Data for this test were collected successfully using both the Period Measurement Technique and the Inverse Kinetic Simulator.

The Control Rod Mechanism Periodic Test (DLCS 66101) was performed on March 15 and 16 with three reactor coolant pumps operating on fast speed. All rod full travel scram times were below the allowable maximum full travel scram time of 1.80 seconds.

TABLE IX

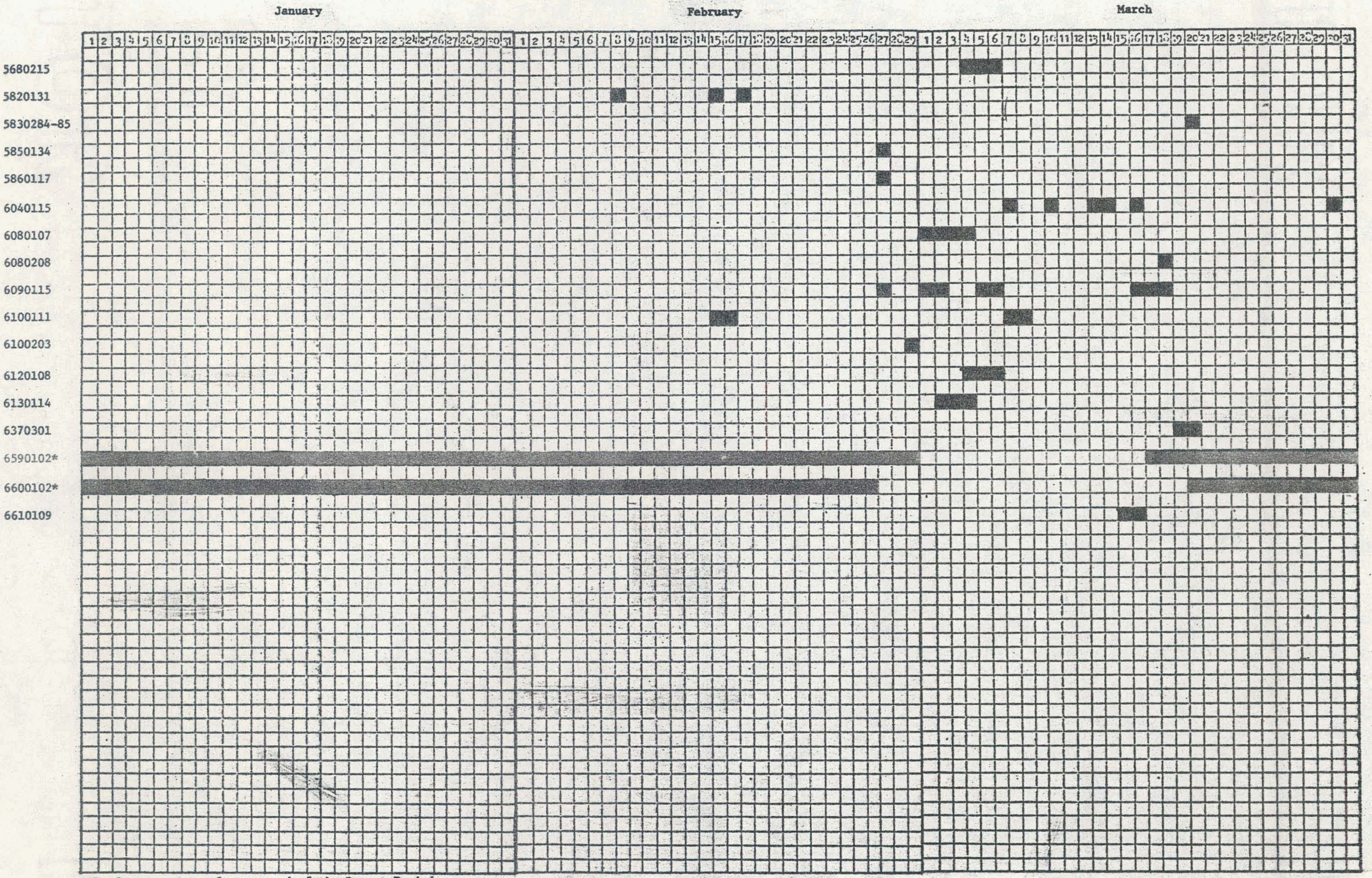
Tests Performed During First Quarter of 1972

DLCS	5680215	Reactor Plant Container Integrity Test (Butterfly Valve Test)
DLCS	5820131	FEDAL System (Checkout Test)
DLCS	5830284-85	FEDAL System (Operation during Station Start-Up)
DLCS	5850134	External Radiation Levels of Reactor Coolant System Piping and Components and Purification System Demineralizers and Heat Exchangers
DLCS	5860117	Periodic Radiation Survey of the Reactor Vessel Head
DLCS	6040115	Data Acquisition System Calibration Test
DLCS	6080107	Nuclear Protection System (Checkout of high Th and P/F Circuitry)
DLCS	6080208	Nuclear Protection System (Checkout of Pump Power, SLOFA and CLOFA circuitry)
DLCS	6090115	Periodic Intercalibration of Temperature Sensing Elements
DLCS	6100111	Periodic Calibration of Pressure Instrumentation
DLCS	6100203	Comparison of Reactor Plant Pressure Instrumentation at Operating Pressure and Temperature
DLCS	6120108	Periodic Calibration of Pressurizer Level Instrumentation
DLCS	6130114	Periodic Calibration of Reactor Plant Flow Instrumentation
DLCS	6370301	Control Rod Position for Criticality at Operating Temperature (Critical Bank Height and Bank Worth Measurements)
DLCS	6610109	Control Rod Drive Mechanism Periodic Test

Tests Remaining in Progress at End of Report Period

DLCS	6590102	Reactor Pressure Drop and Coolant Flow Characteristics
DLCS	6600102	Reactivity Lifetime Test

Performance Dates
of
Tests Performed During First Quarter of 1972



* Performance incomplete at end of the Report Period.

Figure 2

6. GLOSSARY

AEC	United States Atomic Energy Commission
AIX	after ion exchanger (outlet)
a/o	atomic percent
BAPL	Bettis Atomic Power Laboratory
BIX	before ion exchanger (inlet)
bkgd	background
CIC	compensated ionization chamber
DAS	Data Acquisition System
DE	demineralizer effluent
DF	decontamination factor
EFPH	equivalent full power hour
FEDAL	Failed Element Detection and Location System
Hc	critical height
HDS	Heat Dissipation System
magamp	magnetic amplifier
MELBA	Multipurpose Extended Life Blanket Assembly
mr	milliroentgen
mrem	milliroentgen equivalent man
NPS	Nuclear Protection System
ORMS	Operational Radiation Monitoring System
PWR	Pressurizer Water Reactor
R	roentgen
RC	resistance capacitance
μc	microcuries

RCS . . . . Reactor Coolant System

rem . . . . roentgen equivalent man

RPC . . . . Reactor Plant Container

RWDS . . . . Radioactive Waste Disposal System

STP . . . . standard temperature and pressure

su . . . . smear unit (100 sq. cm.)

Tavg . . . . average reactor coolant temperature

Tc . . . . reactor coolant inlet temperature

Th . . . . reactor coolant outlet temperature

Ts . . . . time of sample isolation

v/o . . . . percent by volume

VOS . . . . Valve Operating System