QUARTERLY OPERATING REPORT
First Quarter 1979
DLCS 5000179

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Contract E-(36-1)-292
United States Department of Energy

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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 information on recent technical progress related to the nuclear portion of the Shippingport Atomic Power Station is, therefore, referred to the United States Department of Energy, Technical Information Center at Oak Ridge, Tennessee, where this information is readily available.

1. SUMMARY OF OPERATIONS

At the beginning of the first quarter of 1979, the Shippingport Atomic Power Station was operating with the 1A, B, 1C, and 1D reactor coolant loops and the 1AC and 1BD purification loops in service. The remainder of the expended PWR Core 2 was in storage under shielding water in the deep pit of the Fuel Handling Building.

The 1A, 1B, 1C, and 1D 991 psig self-actuated steam relief valves remained gagged during the quarter to prevent leakage through the valve seats. Gagging of redundant relief valves is permitted by ASME Code and approved operating procedures.

During the quarter, the Station was operated for Duquesne Light Company system grid including base load and swing load operation. Seven (7) swing load operations were performed on the LWBR Core this quarter to complete the LWBR operating plan of fifty (50) during this operating phase. The LWBR Core has generated 10,771.43 EFPH from startup through the end of the quarter. The generator load factor this quarter was 85%.

A Station shutdown occurred on January 7, as the result of a reactor scram. The reactor scram occurred while performing the regular Nuclear Protection System at Power Checks on Seismic Scram Channel 2, Trigger No. 2, utilizing approved operating procedures from the Station Manual. The Station was placed in a safe hot shutdown condition, a check was conducted on the Seismic Scram system and repairs completed. This check revealed that the Seismic Scram System performed as designed and that a component failure (loose terminal connection) in channel 1 had automatically placed the system in a single mode of operation. Application of a test signal to channel 2 was thus sufficient to produce a scram signal from the Seismic Scram System. If this same component failure had occurred in channel 2, the system would still function as required. The seismic scram train checks were satisfactorily tested and returned to service. A reactor precritical check was completed and the reactor taken critical, on January 8. The Station was then returned to service when the main unit generator was synchronized with the Duquesne Light Company system. Full station power was attained January 8.

The Station was shutdown on March 23, for the normal planned semiannual maintenance and testing program. With the reactor coolant pumps in slow speed, a Station cooldown to approximately 150°F and 300 psig on the reactor coolant system was completed and then maintained by the reactor plant cooldown heat exchanger. A steam bubble was maintained in the pressurizer to control pressure on the primary system. At the end of the quarter, the Station remained in a cooled down condition.

The Reactor Coolant System average leak rate for this quarter was ten (10) gallons per hour. The leakage is collected in the Radioactive Waste Processing System and processed as reuse water for the reactor plant water storage tank.

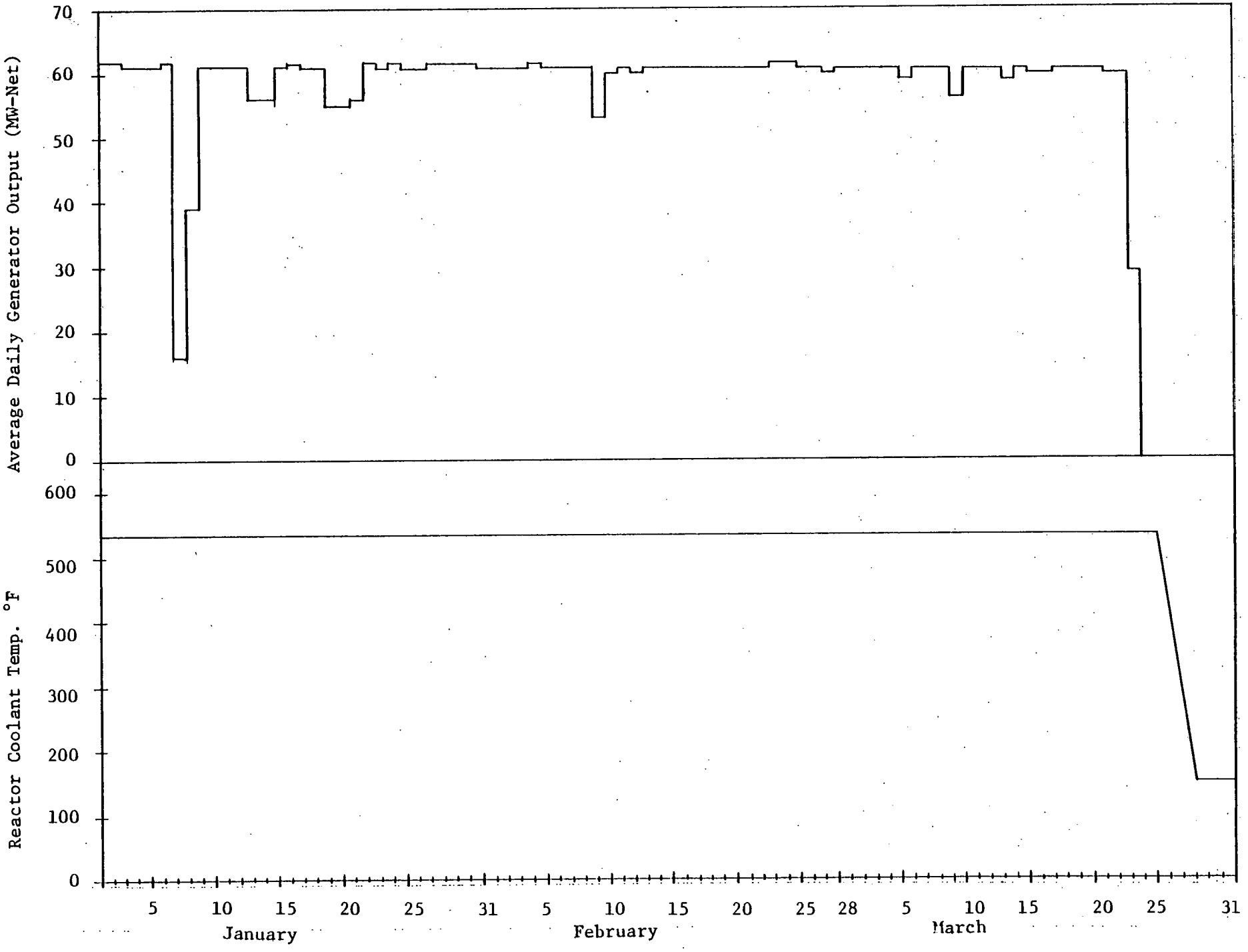
On shift Casualty and Emergency Drills were performed during the quarter by operating personnel.

1. SUMMARY OF OPERATIONS (Cont'd)

There were no radioactive liquid discharges from the Radioactive Waste Processing System to the river this quarter. The radioactive liquid waste effluent line to the river remained blanked off to prevent inadvertent radioactive liquid waste discharges.

During the quarter, approximately 21,000 cubic feet of gas was discharged from the Radioactive Waste Processing containing approximately 0.003 curies of Xe 133 activity.

During the first quarter of 1979, 970 cubic feet of radioactive solid waste was shipped out of state for burial. These shipments contained 4,255 curies of radioactivity which includes irradiated components, however, does not include irradiated fuel which was shipped offsite (See Maintenance Section).



Generator Output and Reactor Coolant Temp. During First Quarter

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Figure 1

2. SUMMARY OF LWBR STATION PERFORMANCE

Electrical output (Gross) to date	kwhr	802,352,000
EFPH to date	hr	10771.43
EFPH for the quarterly period	hr	1891.95
Hours reactor critical to date	hr	12248.50
Hours reactor critical for the quarterly period	hr	1945.30
No. 1 main unit service hours (quarterly period)	hr	1942.30
Net Station Output (quarterly period)	kwhr	116,572,000
No. of forced outages*		1

* Interruption of electrical output due to protective equipment action and/or operator action.

3. CHEMISTRY

During the first quarter of 1979, the Chemistry Section maintained specifications in the various plant systems and fulfilled the station manual requirements.

Reactor Plant

The reactor coolant system was maintained within all chemical specifications without any exceptions during the periods of cold layup, hot standby and operations. Refer to Tables I, II, and III. The only out-of-specification conditions which existed in the reactor plant auxiliary systems occurred in the coolant charging water system and the canal waters. The out-of-specification conditions which existed in the coolant charging water system were that of high pH and specific conductance values.* The high pH's and specific conductances were attributed to the presence of ammonia which entered the system during an ammonium hydroxide chemical treatment of the primary coolant system and the decomposition of hydrazine which was added in order to scavenge any dissolved oxygen. Refer to Table VII. The canal water out-of-specification pH was attributed to the absorbtion of carbon dioxide from the atmosphere. Continued recirculation of the canal waters through the canal water demineralizers aided in raising the water's pH to within specification. See Table VII.

In addition to operational chemistry analyses, during this quarter, Test Procedure LWBR-DLCS 58001, Reactor Coolant Fission Product Monitoring During Reactor Startup, was performed in accordance with test requirements for the fourteenth time. Samples of reactor coolant were drawn and analyzed for Gross Iodine and Iodine-131. The results showed no abnormal peaking of Iodine activities as the reactor power was increased in accordance with scheduled power range operations, verifying the integrity of the core cladding. No other formal chemistry testing during this quarter occurred, however, Test Procedure LWBR-DLCS 59201, Periodic Radiochemical Analysis of LWBR Reactor Coolant, which was performed in the fourth quarter of 1978, was completed and the results are included in this quarterly operating report. Refer to Tables VIII and IX.

Turbine Plant

The station was placed in the three different conditions , that of operating, hot standby, and cold wet layup during the quarter. During the extensive period of operation, the boilers were maintained within all specifications. See Table VI.

* All of the out-of-specification conditions were of short duration and are not expected to have had a detrimental effect on plant materials.

3. CHEMISTRY (cont'd)

During hot standby, the boilers experienced high pH, and high specific conductivities.* The out-of-specification high pH and high specific conductivities were attributed to the steaming down of the boilers which resulted in the concentration of chemicals. Subsequent boiler drain downs and refilling operations aided in restoring the pH and specific conductances to within specifications. Refer to Table V.

While in cold layup during the planned station shutdown, the boilers experienced only one out-of-specification condition which was high hydrazine concentrations.* The high hydrazine concentrations were attributed to the insufficient recirculation of the boiler waters through the turbine plant cooldown heat exchanger and not to chemical over-treatment. Continued recirculation and the draining and refilling of the main unit boiler steam headers lowered the hydrazine concentrations to within specifications. Refer to Table IV.

Radioactive Waste Processing

There were no liquid discharges from the Radioactive Waste Processing System to the river during this quarter.

However, approximately 21,000 cubic feet of gas was discharged from the Radioactive Waste Processing System containing approximately 0.003 curies of radioactivity, mostly Xenon 133. The radioactivity released from Shippingport is far too small to have any measurable effect on the general background environmental radioactivity outside the plant.

* All of the out-of-specification conditions were of short duration and are not expected to have had a detrimental effect on plant materials.

TABLE I

Reactor Coolant System
Water Conditions and Chemical Adjustments
Cold Lay Up (<200°F)

CHEMICAL CONDITIONS	SPECIFICATIONS	ANALYTICAL RESULTS MIN.	MAX.	NH_4OH (LITERS)	H_2 (CU. FT.)	DEGASSIFICATION (HRS.)
pH @ 25°C	10.10-10.30	10.15	10.26			
Specific Conductance (μmhos/cm)	Consistent with pH	35	45			
Total Gas (cc/kg)	125 cc/kg max.	28	40			
Hydrogen (cc/kg)	*No specification	9.5	17.8			
Chloride	0.10 ppm max.	-----	<0.10			
Oxygen	0.14 ppm max.	-----	<0.0050			
Chemicals Added				3	0	0

*No specification if H_2 is not used to scavenge oxygen.

TABLE II

Reactor Coolant System
Water Conditions and Chemical Adjustments
Hot Standby (>200°F)

CHEMICAL CONDITIONS	SPECIFICATIONS	ANALYTICAL RESULT MIN.	ANALYTICAL RESULT MAX.	NH_4OH (LITERS)	H_2 (CU. FT.)	DEGASSIFICATION (HRS.)
pH @ 25°C	10.10-10.30	10.18	10.23			
Specific Conductance (μmhos/cm)	Consistent with pH	37	41			
Total Gas (cc/kg)	125 cc/kg max.	30	71			
Hydrogen (cc/kg)	10 cc/kg min. 60 cc/kg max.	11	27.2			
Chloride	0.10 ppm max.	Not Performed				
Oxygen	0.14 ppm max.	0.005	0.050			
Chemicals Used				0	0	2.5

TABLE III

Reactor Coolant System
Water Conditions and Chemical Adjustments
Operating Conditions

Chemical Conditions	Specifications	Analytical Results min.	max.	NH_4OH (liters)	H_2 (cu.ft.)	Degassification- (Hrs.)
pH @ 25°C	10.10-10.30	10.10	10.30			
Specific Conductance (μmhos/cm)	Consistent with pH	26	52			
Chloride	0.10 ppm max.	---	<0.10			
Total Gas (cc/kg)	125 cc/kg max.	71	110			
Hydrogen (cc/kg)	10 cc/kg min. 60 cc/kg max.	23	51			
Chemicals Used				148.0	0	61.7

TABLE IV

Non-Operating Boiler Chemistry
Cold Layup (<200°F) Water Chemistry

Water Conditions	Specifications	Boilers			
		1A	1B	1C	1D
pH @ 25°C	min. 9.30 max. 10.50	9.43 9.60	9.40 9.69	9.41 9.62	9.45 9.70
Specific Conductance	min. ----- max. 30 µmhos/cm	16 18	17 18	15 18	16 18
Chloride	min. ----- max. 0.20 ppm	---- <0.10	---- <0.10	---- <0.10	---- <0.10
Hydrazine	min. 50 ppm max. 100 ppm	100 120*	98 113*	105* 118*	98 117*
Chemicals Used (lbs) N_2H_4		25.7	18.7	18.7	25.7

*NOTE: See Turbine Plant Section of QOR

TABLE V

Non-Operating Boiler Chemistry
Hot Standby (>200°F) Water Chemistry

Water Conditions	Specifications	Boilers			
		1A	1B	1C	1D
pH @ 25°C	min. 8.50 max. 9.30	8.52 9.06	8.85 9.49*	8.75 9.50*	8.70 9.15
Specific Conductance	min. ---- max. 10 µmhos/cm	4.1 6.8	5.3 13.5*	4.4 14.5*	4.3 8.4
Chloride	min. ---- max. 0.20 ppm	---- <0.10	---- <0.10	---- <0.10	---- <0.10
Morpholine	min. 0.50 ppm max. 6.0 ppm	0.70 2.6	0.65 3.3	0.55 3.0	0.95 3.4
Chemicals Used (lbs) C_4H_9NO		0.61	0.59	0.42	0.62

* NOTE: See Turbine Plant Section of QOR

TABLE VI

Operating Boiler Water Chemistry
Volatile Water Chemistry

Water Conditions	Specifications	Boilers			
		1A	1B	1C	1D
pH @ 25°C	min. 8.50	8.50	8.51	8.50	8.55
	max. 9.30	9.07	9.10	9.12	9.10
Specific Conductance	min. ----	3.5	3.4	3.3	3.5
	max. 10 µmhos/cm	6.6	6.7	6.2	6.8
Hydrazine	min. 0.005 ppm	0.035	0.025	0.025	0.035
	max. 0.125 ppm	0.095	0.065	0.065	0.115
Morpholine	min. 0.50 ppm	0.55	0.55	0.55	0.75
	max. 6.0 ppm	1.45	1.45	2.10	1.45
Silica	min. ----	0.80	0.78	0.90	0.96
	max. 5 ppm	1.36	1.22	1.10	1.04
Chloride	min. ----	----	----	----	----
	max. 0.20 ppm	<0.10	<0.10	<0.10	<0.10
Chemicals Used (lbs)					
N_2H_4		20.25	20.25	20.25	20.25
C_4H_9NO		50.88	50.88	50.88	50.88

TABLE VII

Reactor Plant Auxiliary Systems
Water Conditions

System	Conductivity μmhos/cm	pH at 25°C	Conc. - ppm			Gross Gamma Activity - μCi/ml
			CrO_4^{--}	Cl^-	Dis. O_2	
Component Cooling Specifications	N.S	8.30 - 10.50	500-1000	1 ppm max.	N.S.	N.S.
Observed	N.P.	N.P.	501-643	0.10-0.40	N.P.	2.34×10^{-7} - 3.40×10^{-7}
Coolant Charging Water Specifications	2.50 max.	6.00 8.00	N.S.	0.1 ppm max.	Note	N.S.
Observed	4.3* - 8.6*	6.85 - 8.85*	N.P.	<0.10	0.005 - 6.5**	N.P.
Canal Water Specifications	5.00 max.	5.80 - 8.00	N.S.	N.S.	N.S.	N.S.
Observed	0.65 - 1.65	5.25*-7.15	N.P.	N.P.	N.P.	8.5×10^{-7} - 1.0×10^{-6}

Specification is <0.14 ppm for reactor plant cold wet layup.
*See Reactor Plant Section of QOR.
**No Specification For Dissolved Oxygen Under Operating Conditions

N.S.: No limit needed, therefore, no limit has been specified.
N.P.: Analysis is not necessary and not performed.
MDA is 8.39×10^{-8} μCi/ml

TABLE VIII
PRIMARY SYSTEM LONG LIVED CRUD ANALYSIS

DATE	EFPH AT SAMPLE TIME	VOLUME OF COOLANT IN LITERS	CRUD WEIGHT IN mg.	ACTIVITY IN μci/ml								% ACC.
				60 Co	58 Co	95 Zr	59 Fe	51 Cr	54 Mn	OTHER	TOTAL	
11/16/77	946	150.57	1.19	1.0×10^{-5}	1.0×10^{-5}	1.4×10^{-7}	4.3×10^{-8}	7.0×10^{-6}	5.5×10^{-7}	None	3.20×10^{-5}	94.5
7/10/78	5484.47	667.32	8.09	2.04×10^{-5}	2.86×10^{-5}	1.33×10^{-7}	4.56×10^{-6}	2.04×10^{-6}	1.84×10^{-6}	None	5.76×10^{-5}	105.2
11/16/78	7869.54	1082.51	4.97	9.7×10^{-6}	1.8×10^{-5}	7.7×10^{-8}	1.2×10^{-6}	4.1×10^{-7}	8.9×10^{-7}	None	3.03×10^{-5}	92.3

TABLE IX

LWBR STARTUP AND POWER RANGE TESTING ACTIVATION AND FISSION PRODUCT ANALYSIS

DATE	SAMPLE TIME	SAMPLE LOCATION	FLOW RATE LBS/HR	RX EFPH	NO. OF LOOPS IN SERVICE	NO. IX'S IN SER.	% REACTOR POWER	MEASURED ACTIVITIES IN μci/ml AT SAMPLE TIME											
								* GROSS IODINE	** 131 I	** 133 I	89 Sr	90 Sr	140 Ba	134 Cs	137 Cs	133 Xe	135 Xe	** 41 Ar	Gross α
11/19/77	1400	AC-BIX	6.634×10	1007	4	2	96	2.1×10^{-4}	8.3×10^{-7}	1.3×10^{-5}									
11/21/77	1909	AC-BIX	6.634×10	1056	4	2	97				4.7×10^{-8}	1.1×10^{-9}	1.1×10^{-7}	*** <MDA	1.8×10^{-8}				2.0×10^{9}
11/16/77	1315	AC-BIX	6.634×10	940	4	2	97									1.2×10^{-4}	2.5×10^{-4}	1.6×10^{-2}	
5/22/78	1538	AC-BIX	6.604×10	4433	4	2	98	4.62×10^{-4}	2.34×10^{-6}	3.59×10^{-5}									
5/25/78	1328	AC-BIX	6.604×10	4496	4	2	98				9.09×10^{-7}	2.68×10^{-9}	5.35×10^{-8}	8.53×10^{-9}	1.53×10^{-8}				3.93×10^{-9}
5/22/78	2008	AC-BIX	6.604×10	4438	4	2	98									1.45×10^{-4}	3.14×10^{-4}	3.87×10^{-3}	
11/15/78	1530	AC-BIX	6.554×10	7842	4	2	98	6.45×10^{-4}	3.13×10^{-6}	4.53×10^{-5}									
11/20/78	1130	AC-BIX	6.534×10	7949	4	2	98				3.2×10^{-7}	3.5×10^{-9}	3.8×10^{-7}	2.0×10^{-8}	5.3×10^{-8}				1.11×10^{-9}
11/15/78	1130	AC-BIX	6.554×10	7838	4	2	98									2.74×10^{-4}	7.33×10^{-4}	5.27×10^{-3}	

* Gross iodine values are extrapolated to 100% power and maximum purification flow at one hour after sampling

** Activity is extrapolated to 100% power and maximum purification flow at sample time

*** MDA = 6.5×10^{-9} μCi/ml

4. MAINTENANCE

Scheduled preventative, as well as corrective maintenance, was performed on plant equipment during this report period. The scheduled testing and maintenance shutdown started March 23, 1979.

Significant work items completed or in progress during this period are summarized as follows:

Turbine Plant

Retubing of the Condensate Cooler, along with the overhauling of the 1A Screenwash pump and the No. 2 Control Air Compressor was completed.

Reactor Plant

Storage of the two (2) Core 1 Westinghouse Main Coolant Pumps was completed. The charging system fill pump (used to fill an isolated and drained main coolant loop following maintenance) and the Decon Room Sump Pump (used to transfer decontamination solutions from equipment maintenance) were both placed out of service during this report period due to shaft bearing failure. Repair of the fill pump and the Decon Room Sump Pump was completed and the periodic overhaul of both the "A" and "B" Vent Gas Compressors was completed. The shipout and disposal of PWR-1 and 2 components that were stored in the fuel storage pit was completed. Removal of additional underwater racks and equipment from Canal Storage Pits was in progress.

PWR II Fuel Shipments

The sixth and seventh shipments of the PWR-II spent fuel in the M-160 irradiated fuel shipping container was completed this quarter. The expended fuel assemblies were shipped off-site for disposal. Preparations for the eighth and final shipment were started.

5. TEST PROGRAM

The primary objective of the test program during the quarterly report period was to continue reactivity depletion of the LWBR Core for proof of breeding. The third scheduled testing and maintenance shutdown was started on March 23 and continued through the end of the quarter.

Twenty-five tests were performed during the report period. Eighteen tests were completed and seven remained in progress at the end of the quarter. Table X lists these tests and Figure 2 indicates the performance dates. Information pertaining to Chemistry tests may be found in the Chemistry Section of this report.

The fourth performance of test procedure LWBR-DLCS 50001, Seismic Scram System Functional Test, was satisfactorily performed at the beginning of the testing and maintenance shutdown. The purpose of the test was to align the seismic triggers, verify proper operation of system components and to verify proper interface with the Nuclear Protection System.

The required monthly performances of test procedure LWBR-DLCS 55201, Safety Injection System Monthly Periodic Pump Tests, were satisfactorily performed during the quarter. Deepwell pumps 19-G1-1 and 2 continued to show steady performance during the quarter. The new deepwell pump 53-G2-4009 showed a slight decrease in flowrate from that measured during the previous quarter. However, the flowrate is still well above the acceptable flowrate. Individual testing of the Boiler Feed Pumps was conducted each month and both pumps continue to operate satisfactorily.

The third performance of test procedure LWBR-DLCS 55202, SIS Semiannual Periodic Pump Tests, was still in progress at the end of this quarter. Testing was completed, and proper operation verified for the following SIS pumps: booster, high pressure, No. 1 and No. 2 flooding, No. 1 recirculation, and the 1B gravity drain. The 1A gravity drain pump was tested along with the 1B gravity drain pump prior to the spring shutdown, but did not develope full flow due to a flow restriction. This is one of four redundant components and could not have prevented proper operation of safety injection. An investigation of the problem is in progress, a retest will follow.

The fourth and fifth performances of test procedure LWBR-DLCS 55203, SIS Quarterly Periodic Valve Test, were satisfactorily completed during the quarter. The fourth performance was started during the fourth quarter of 1978, and all valves tested were satisfactorily cycled except valves 53-H12-4001 and 53-H13-4001. Failure was traced to solenoid valve 53-H12-4001. The valve was replaced, and retested, but failed again. The valve was replaced for the second time, and the valves were then successfully cycled. Operation of these valves is required for feed pump recirculation during an inadvertant Safety Injection and are not required for proper operation of Safety Injection when needed. The fifth performance of the test was performed in March with all valves meeting the acceptance criteria. Valves 53-H12-4004 and 4005 were cycled successfully during this fifth test, when the SIS lines were drained during the Spring Shutdown, which is in accordance with the Test Procedure.

5. TEST PROGRAM (cont'd)

The third performance of test procedure LWBR-DLCS 55204, SIS Semiannual Periodic Valve Test remained in progress at the end of the quarter. Various SIS motor operated and solenoid operated valves were tested for proper operation using both switch and/or relay control. Due to controlling plant conditions, valve 53-H12-4301 remained to be tested at the end of the quarter. All valves tested cycled properly, and all operating times met the acceptance criteria of the Test Procedure.

The initial performance of test procedure LWBR-DLCS 55205, SIS Automatic Operation Checkout, was satisfactorily performed during the quarter. This test simulated an actual safety injection initiation coupled with a loss of station AC power. The purpose was to verify proper operation of all the automatic features of the Safety Injection System. The acceptance criteria were met as follows:

1. Both diesel generators successfully started immediately upon the loss of all AC signals.

2. A scram signal was generated by the SIS Control System.

3. All automatic valves operated as required upon receiving the SIS signal.

4. All SIS pumps started automatically and remained on until intentionally shutdown.

5. All circuit breakers and 480VAC contactors operated as required.

Due to an error in the initial test conditions imposed by the test procedure, the 1A and 1B Boiler Feed pumps and the SIS Booster pump and there associated circuit breakers were not sequenced on as intended. Since the boiler feed pumps and booster pump were energized by control circuits which functioned as designed for the actual conditions imposed by the test procedure and all other safety injection system components functioned as required, the test was judged to have been successfully completed. Revisions to the test procedure are being developed to ensure that the boiler feed pumps and booster pump are sequenced onto the diesel generator - energized emergency bus by the load sequencer for subsequent performances of this test. Proper operation of Safety Injection does not require sequencing of electrical loads.

The second performance of test procedure LWBR-DLCS 56801, Reactor Plant Container Integrity Test (Containment Isolation Penetrations), remained in progress at the end of the quarter. The objective of the test is to determine the leak rate of the containment isolation valves. Seven valves were to be tested. At the end of the quarter, four had been tested; 43-H12-4005, 16-H16-4007, 41-H12-4001 and 41-H12-4002. All four valves met the acceptance criteria of the Test Procedure. Three valves remained to be tested; 16-H12-4002, 41-H12-4003 and 41-H12-4004.

5. TEST PROGRAM (cont'd)

The fifth performance of test procedure LWBR-DLCS 56802, Reactor Plant Container Integrity Test (Butterfly Valve Test), was satisfactorily performed. This test checked proper operation of the air treatment butterfly valves and proper pressurization of the inlet and exhaust interspaces between the butterfly valves.

The sixth performance of test procedure LWBR-DLCS 58201, DN Loop Monitoring System Checkout Test, remained in progress at the end of the quarter. Proper operation of the DNLM system was determined by checking the count rate calibration of each amplifier channel, and the background and neutron sensitivity of each monitor assembly. The number one monitor has five operable amplifier channels, while the number two monitor has four operable amplifier channels. The test was completed at the end of the quarter, except for setting the flow rate through the monitors which could not be done until proper plant conditions were established for reopening valve 36-H16-10 and then the plant returned to 4 pump operation at normal operating temperature. Neither of these monitors are required for a safety related function.

Test procedure LWBR-DLCS 58301, DNLM System (Operation During Station Startup), was performed satisfactorily for the sixteenth time during the unscheduled reactor startup in January. The delayed neutron activity level in the sample flow from the A and B main coolant loops was continuously recorded during station startup to test for possible fuel assembly cladding defects.

The fourth performance of test procedure LWBR-DLCS 60901, Periodic Intercalibration of Temperature Sensing Elements, was satisfactorily completed. A one point check at 531°F was performed as scheduled, and all instruments met the test procedure acceptance criteria, except the T_{avg} instrument. The T_{avg} instrument required maintenance, and was retested satisfactorily.

Test procedure LWBR-DLCS 61001, Periodic Calibration of Pressure Instrumentation, was satisfactorily completed for the fifth time. Only the wide range pressurizer pressure Norwood indicator and Bailey recorder were scheduled for calibration this shutdown. The Norwood indicator required a minor zero adjustment*, and then tested satisfactory. The Bailey recorder readings were within the tolerance specified in the test procedure.

The first performance of test procedure LWBR-DLCS 61202, Pressurizer Level Calibration Check and Adjustment, was satisfactorily completed during the shutdown. This test checks the calibration of the pressurizer level instrumentation and permits minor adjustments if necessary. The pressurizer level narrow range instrumentation checked out satisfactory. Minor adjustments* were made to the pressurizer level wide range, and to the SIS pressurizer level instrumentation. After adjustments , both the wide range and SIS pressurizer level instrumentation were within the acceptance criteria specified by the test procedure.

* None of the minor calibration errors in the redundant instruments would have prevented proper operation of any safety related function.

5. TEST PROGRAM (cont'd)

The sixth performance of test procedure LWBR-DLCS 61301, Periodic Calibration of Reactor Plant Flow Instrumentation, was satisfactorily completed during the shutdown. The 1A and 1C coolant loop flow instruments were calibrated at this time. The 1A coolant loop flow required a zero adjustment*, and the 1C coolant loop flow required a zero and span adjustment*. After adjustments, both instruments checked out satisfactorily.

The fifth performance of test procedure LWBR-DLCS 62101, Periodic Checkout and Calibration of the Inverse Kinetics Simulator (IKS), was satisfactorily performed. Test signals were applied to the input circuits of the Brown recorders, IKS computer and Kiethley picoammeter to assure each instrument was functioning properly prior to scheduled physics testing. An additional check of the IKS was also satisfactorily made at a reduced power level, as required by the test procedure.

The fifth performance (fourth performance of the abbreviated version) of physics test procedure LWBR-DLCS 63301, Xenon Reactivity Transient, was satisfactorily completed.

The sixth performance of test procedure LWBR-DLCS 63501, Flux Wire Activations, was satisfactorily performed at equilibrium conditions prior to the spring shutdown. Ten Copper-Nickle wires were irradiated at this time as scheduled.

The fourth performance of test procedure LWBR-DLCS 64201, Neutron Noise Monitoring Test, was satisfactorily completed at approximately 10,200 EFPH, as required by the Test Index.

Physics test procedure LWBR-DLCS 64601, Bank Reactivity Worth and Moderator and Power Coefficients of Reactivity at Power, was satisfactorily performed for the third time, just prior to the Spring Shutdown.

The second performance of test procedure LWBR-DLCS 65001, Thorium and U233 Activations, was satisfactorily completed during the quarter. Four Thorium and four U233 wires were irradiated during this performance.

Test Procedure LWBR-DLCS 66001, Reactivity Lifetime Test, which is an on-going test, continued through the report period.

The second performance of LWBR-DLCS 66101, Movable Fuel Control System Drive Mechanism and Bypass Inlet Flow Periodic Test, remained in progress at the end of the quarter.

Special test procedure LWBR-DLCS 70801, Transferring Test Tank Water to Canal Pit, which is an on-going test, was performed at various times during the quarter.

During planned semi-annual physics testing subsequent to this report period, an unexpected higher value of the flow coefficient of reactivity was measured. Additional testing was developed and will be reported separately.

* None of the minor calibration errors in the redundant instruments would have prevented proper operation of any safety related function.

TABLE X

TESTS PERFORMED DURING FIRST QUARTER OF 1979

LWBR-DLCS	5000104	Seismic Scram System Functional Test
LWBR-DLCS	5520116-18	SIS Monthly Periodic Pump Tests
LWBR-DLCS	5520304-05	SIS Quarterly Periodic Valve Test
LWBR-DLCS	5520501	SIS Automatic Operation Test
LWBR-DLCS	5680205	Reactor Plant Container Integrity Test (Butterfly Valve Test)
LWBR-DLCS	5800114	Reactor Coolant Fission Product Monitoring During Reactor Startup
LWBR-DLCS	5830116	DN Loop Monitoring System (Operation During Station Startup)
LWBR-DLCS	5920102	Periodic Radiochemical Analysis of LWBR Reactor Coolant
LWBR-DLCS	6090104	Periodic Intercalibration of Temperature Sensing Elements
LWBR-DLCS	6100105	Periodic Calibration of Pressure Instrumentation
LWBR-DLCS	6120201	Pressurizer Level Calibration Check and Adjustment
LWBR-DLCS	6130106	Periodic Calibration of Reactor Plant Flow Instrumentation
LWBR-DLCS	6210105	Periodic Checkout and Calibration of the Inverse Kinetics Simulator (IKS)
LWBR-DLCS	6330105	Xenon Reactivity Transient
LWBR-DLCS	6350106	Flux Wire Activations
LWBR-DLCS	6420104	Neutron Noise Monitoring Test
LWBR-DLCS	6460103	Bank Reactivity Worth and Moderator and Power Coefficients of Reactivity at Power
LWBR-DLCS	6500102	Thorium and U233 Activations

TESTS REMAINING IN PROGRESS AT END OF REPORT PERIOD

LWBR-DLCS	5520203	SIS Semiannual Periodic Pump Tests
LWBR-DLCS	5520403	SIS Semiannual Periodic Valve Test
LWBR-DLCS	5680102	Reactor Plant Container Integrity Test (Container Penetrations)
LWBR-DLCS	5820106	DN Loop Monitoring System Checkout Test
LWBR-DLCS	66001	Reactivity Lifetime Test
LWBR-DLCS	6610102	Movable Fuel Control System Drive Mechanism and BIF Periodic Test
LWBR-DLCS	7080101	Transferring Test Tank Water to a Canal Pit

Performance Dates of Tests Performed During First Quarter

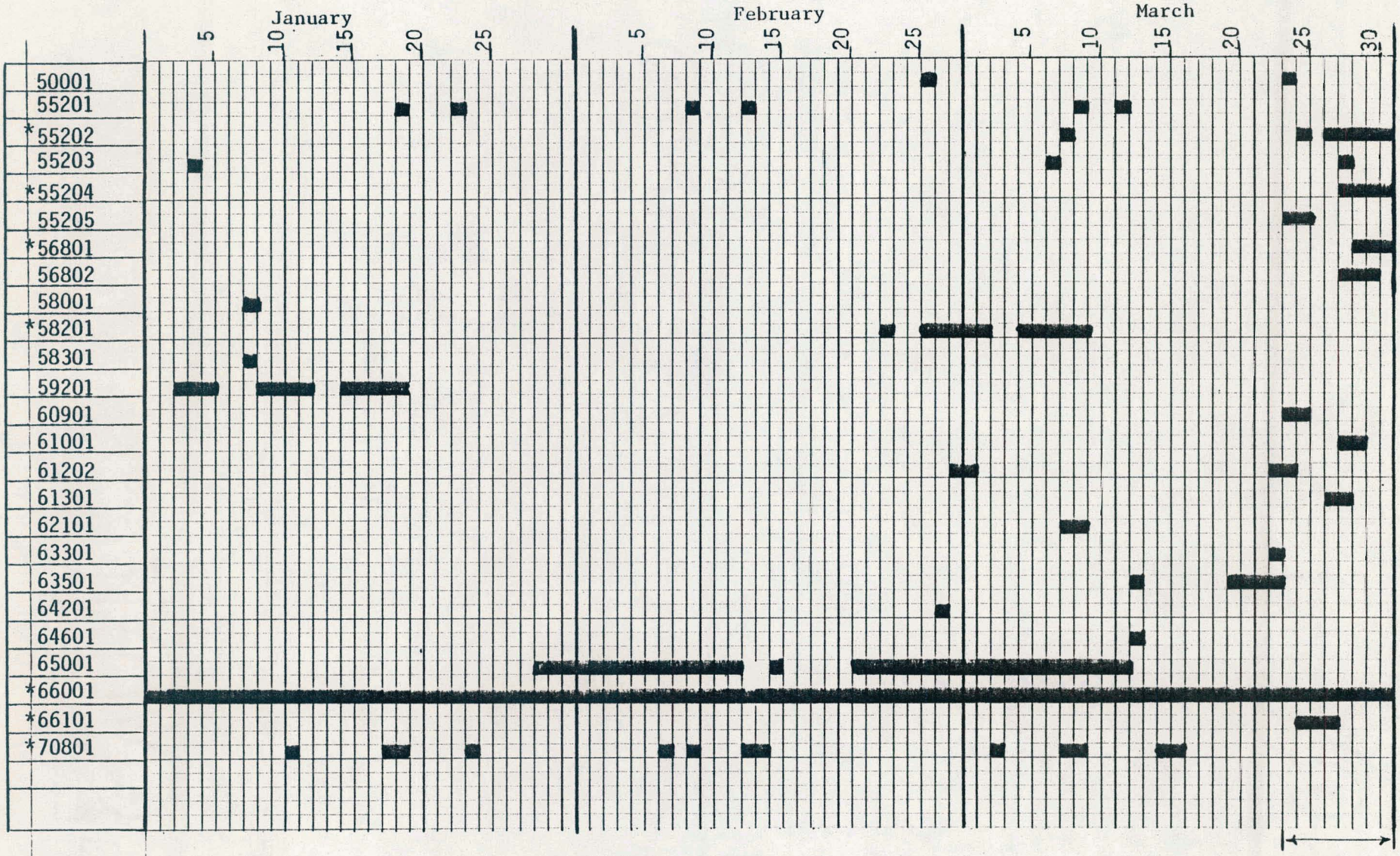

Figure 2

*Performance incomplete at end of report period.

6. HEALTH PHYSICS

External Radiation Exposure

Table XI provides information on radiation exposure experience of Duquesne Light Company personnel at the Shippingport Station. Table XI is based on a standard form used for radiation exposure experience at central station nuclear power plants.

ANNUAL REPORT OF EXTERNAL RADIATION EXPOSURE EXPERIENCE AT SHIPPINGPORT
-1978-
TABLE XI

Work & Job Function	Number of Personnel (>100 mrem) Station Emp.	Other Emp.*	Total Man-Rem Station Emp.	Other Emp.*
Reactor Operations & Surveillance				
Maintenance Personnel	0		0	
Operating Personnel	11		2	
Health Physics Personnel	1		1	
Supervisory Personnel	0		0	
Engineering Personnel	0		0	
Routine Maintenance				
Maintenance Personnel	31		8	
Operating Personnel	0		0	
Health Physics Personnel	12		6	
Supervisory Personnel	10		2	
Engineering Personnel	0		0	
Inservice Inspection				
Maintenance Personnel	3		1	
Operating Personnel	0		0	
Health Physics Personnel	1		1	
Supervisory Personnel	0		0	
Engineering Personnel	0		0	
Special Maintenance				
Maintenance Personnel	19		4	
Operating Personnel	0		0	
Health Physics Personnel	5		3	
Supervisory Personnel	4		1	
Engineering Personnel	1		1	
Waste Processing				
Maintenance Personnel	1		1	
Operating Personnel	1		1	
Health Physics Personnel	0		0	
Supervisory Personnel	4		1	
Engineering Personnel	0		0	
Refueling				
Maintenance Personnel	0		0	
Operating Personnel	0		0	
Health Physics Personnel	0		0	
Supervisory Personnel	0		0	
Engineering Personnel	0		0	
TOTAL				
Maintenance Personnel	54		14	
Operating Personnel	12		3	
Health Physics Personnel	19		11	
Supervisory Personnel	18		4	
Engineering Personnel	1		1	
GRAND TOTAL	104	0	33	0

*Duquesne Light Company employees not regularly assigned to Shippingport Station.

7. GLOSSARY

AIX	after ion exchanger (outlet)
a/o	atomic percent
BAPL	Bettis Atomic Power Laboratory
BIX	before ion exchanger (inlet)
CIC	compensated ionization chamber
DAS	Data Acquisition System
DE	demineralizer effluent
DF	decontamination factor
DOE	Department of Energy
EFPH	equivalent full power hour
Hc	critical height
LWBR	Light Water Breeder Reactor
magamp	magnetic amplifier
MDA	Minimum Detectable Activity
mR	milliroentgen
mrem	milliroentgen equivalent man
NIS	Nuclear Instrumentation System
NPS	Nuclear Protection System
ORMS	Operational Radiation Monitoring System
PWR	Pressurized Water Reactor
QOR	Quarterly Operating Report
R	roentgen

7. GLOSSARY (Cont'd)

	resistance capacitance
	Reactor Coolant System
ɛm	roentgen equivalent man
RPC	Reactor Plant Container
RWPS	Radioactive Waste Processing System
STP	standard temperature and pressure
su	smear unit (100 sq. cm)
Tavg	average reactor coolant temperature
Tc	reactor inlet coolant temperature
Th	reactor outlet coolant temperature
Ts	time of sample isolation
µCi	microcuries
V/O	percent by volume
VOS	Valve Operating System