DLCS 5000171

MASTER

DUQUESNE LIGHT COMPANY
Shippingport Atomic Power Station

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Quarterly
OPERATING REPORT

First Quarter
1971

Contract AT-11-1-292

United States Atomic Energy Commission

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QUARTERLY OPERATING REPORT
First Quarter 1971
DLCS 5000171

Approved by

F. J. Bissert
Superintendent

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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 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 1971, the Shippingport Atomic Power Station was operated for Duquesne Light Company system load demand, testing and maintenance. The Heat Dissipation System was in operation from January 20 through January 24.

At the beginning of the period, the Station was operating with 3 Reactor Coolant Loops in service with the 1C Loop isolated and drained for maintenance. On January 17, the 1C Loop was returned to service and the Station operated with 4 loop full-flow conditions to establish equilibrium xenon, in preparation for the third full power demonstration of PWR Core 2 Seed 2. The load was increased to 100% power (150 MWG) on January 22 and maintained the required 48 hours for the test run. The test was completed and the HDS was shutdown at 2:05 A. M. on January 24.

A routine chemical analysis of the 1A Boiler on January 14 indicated a primary to secondary leak rate of approximately 0.1 gph. At the end of the period the 1A Boiler leak rate had increased to 9 gph. On February 4, a primary to secondary leak of approximately 2 gph was detected in 1D Boiler. The 1D Boiler was cooled down for tube inspection and repairs on February 17. The Boiler remained out of service for the remainder of the quarter. The Reactor Coolant System net leak rate at the beginning of the period was determined to be 12 gph, and 20 gph by the end of the period.

On January 16, a Reactor Safety Insertion-high power in intermediate range incident occurred resulting from a rapid increase in power. The cause was determined to be a malfunction of the main turbine governor.

On February 12, the Main Unit Generator was taken off the line, but the reactor was maintained critical for hot plant reactor physics testing. A shutdown and plant cooldown was undertaken on February 15 for operations, testing, and training. The station returned to power operation on March 10.

On March 15, nightly training shutdowns were initiated for Class II candidates and continued to the end of the period. The 1D Loop remained isolated and drained at the end of the period.

During the first quarter period, no shipments of solid radioactive waste were made from the facility.

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	2,712,914,700
EFPH to date (Blanket operating time)	hr	18,772.1
EFPH to date (Seed 2 operating time)	hr	5,120.1
EFPH for the quarterly period	hr	604.6
Hours reactor critical to date	hr	41,469.0
Hours reactor critical for the quarterly period	hr	1,453.6
No. 1 main unit service hours (quarterly period)	hr	1,334.0
Net Station output (quarterly period)**	kwhr	71,569,000
No. of forced outages*		0

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

**Does not include 1,000 kwhr (23 KV Emerg. Trans. - STA SERVICE) error for March, which will be corrected in April. This figure would be reflected in the negative in the Net Station Output, resulting in a 71,568,000 figure for the quarter ending March 31, 1971.

3. Chemistry

During the first quarter of 1971, the chemistry section maintained water specifications in the various plant systems and fulfilled manual requirements.

Reactor Plant

The AC purification demineralizer remained out of service until January 4, 1971 and was then placed back in service until January 12. It was again returned to service on January 17 and remained in service through the end of the quarter. The BD purification demineralizer was in service until February 16 after which it remained out of service through the end of the quarter. The only out of specification condition observed was a pH of 9.97 on March 11, 1971. Following shutdown, with a very low gas concentration, the station went to 67% power for testing. In achieving equilibrium between the gas and ammonium ion concentration at power, apparently a large amount of the ammonium was dissociated resulting in a lowered pH. Results from chemical analyses can be found in Tables I and II.

The component cooling water and the canal waters were maintained within chemical specifications throughout the quarter. The coolant charging water was observed to be out of specifications at various times. Explanation can be found as a footnote to Table III.

The Cs^{138} activity of the reactor coolant remained relatively low and increased only slightly during the quarter. The average monthly activity follows, corrected to the standard base of 67% reactor power, four reactor coolant loops, two purification demineralizer loops at full flow, and 536°F. T_{avg} .

Average Cs^{138} Activity

<u>Month</u>	<u>dpm/ml</u>	<u>uc/ml</u>	<u>No. of Observations</u>
January	437	1.99×10^{-4}	17
February	442	2.01×10^{-4}	4
March	466	2.12×10^{-4}	6

The reactor coolant was sampled for tritium activity on March 4, 1971, at 4937 EFPH. The result, 0.6 uc/liter, is consistent with previous values.

A reactor coolant sample collection was performed January 6-7 at 4563 EFPH in keeping with station manual requirements for sampling every 1000 EFPH. Analysis of the samples continues at the end of the quarter. Results from the previous 1000 hr. collection, taken August 25-26, 1970, at 3827 EFPH, can be found in Tables IV and V.

Throughout the quarter, the flow through the purification demineralizer was maintained at 33,000 pounds/hour. The gross non-volatile gamma activity after 15 minutes decay ranged from 8,666 cpm/ml at 15% power to 56,265 cpm/ml at 67% power. The D. F. across the demineralizers ranged from 320 to 716 after 15 minutes decay. There were no 120 hour gross gamma activities observed which gave any indication of higher than normal levels of corrosion products.

The specific activity of 5 routine weekly crud samples ranged from 4.27×10^6 to 2.42×10^7 cpm/mg, with crud concentrations from 3.30 to 7.31 ppb.

Turbine Plant

The 1C Heat exchanger remained out of service until January 17, 1971. A primary to secondary leak of 0.09 gallons per hour was detected in the 1A heat exchanger January 14, 1971; the leak reached a maximum rate of 9.24 gallons per hour at the end of the quarter. A primary to secondary leak of 2.09 gallons per hour was detected in the 1D heat exchanger on February 4, 1971. It was isolated February 14, 1971 for repairs with a maximum leak rate of 2.44 gallons per hour; the repairs continue at the end of the quarter.

Extensive personnel training took place during the quarter which involved overnight and weekend shutdowns, and station cooldowns and heat ups. Cooldown heat exchanger training was performed in which only the 1B heat exchanger was utilized for drain down. This accounts for the comparatively large amounts of chemical additions made to the 1B heat exchanger. A scheduled station shutdown for testing and training took place from February 12 to March 10. Various other hot and cold lay-ups occurred during this period. The chemistry involved is summarized in Tables VI and VII. Various out of specification results occurred. Explanations can be found in footnotes to the tables.

Radioactive Waste Disposal System

The Radioactive Waste Disposal System was operated according to the previous methods until March 9, 1971. On that date, a new system was instituted utilizing a fixed series of various ion exchange media. Experimentation with various filters began, and continues at the end of the quarter.

Thirty-three test tanks, with tritium activity ranging from 2.26×10^{-4} uc/ml to 4.80×10^{-4} uc/ml, were discharged to the Ohio River during this quarter. These test tanks were composed of water from the chemical waste tanks, processed through the evaporator, and water from the surge tanks, processed through the ion exchangers.

The Xe^{133} activity of the vent gas system ranged from 30.2 dpm/ml (1.4×10^{-5} uc/ml) to 2.4 dpm/ml (1.1×10^{-6} uc/ml). Xe^{135} activity was detected in one sample and was determined to be 14.2 dpm/ml (6.5×10^{-6} uc/ml). The maximum Xe^{133} and the one Xe^{135} detection immediately followed venting of the blowoff tank to the vent gas system.

All other wastes continued to be processed in the usual manner.

TABLE I

Reactor Coolant System

Water Conditions and Chemical Adjustments

Operating Conditions

January 1 -- March 31, 1971

Chemical Condition	Specifications	Analytical Results		NH ₄ OH Additions Liters	Degassification Hours
		Min.	Max.		
1. pH @ 25° C	10.20 ± 0.10	9.97 (1)	10.30	151.2	84
2. Specific Conductivity umhos	- - - -	29	52		
3. Ammonia - ppm	- - - -	29	52		
4. Total Gas - cc/kg	125 Maximum	22	108		
5. Hydrogen - cc/kg	10 - 60	13	58		

(1) pH below minimum specifications - refer to Reactor Plant Section for explanation.

TABLE II
Reactor Coolant System
Water Conditions and Chemical Adjustments
Shutdown Conditions

January 1 - March 31, 1971

Chemical Conditions	Temp.	Specifications	Analytical Results		NH ₄ OH Additions Liters	H ₂ Addition cu. ft.
			Min.	Max.		
1. pH @ 25° C	> 200°F.	10.10 - 10.30	10.15	10.30	22.7	181
	< 200°F.	6.0 - 10.50	9.70	10.23		
2. Total Gas - cc/kg	536°F.	125 Max	22	92		
	< 536°F.	80 Max	24	55		
	< 200°F.	25 Max (1)	-	-		
3. Hydrogen - cc/kg	> 200°F.	10 - 60	10	47		
	< 200°F.		14	16		
4. Oxygen - ppm	> 200°F.	< 0.14	0.010	0.025		
	< 200°F.	< 0.3	0.010	0.025		
5. Chloride - ppm	> 200°F.	< 0.1	< 0.05			
	< 200°F.	< 0.1	< 0.05	< 0.05		

(1) 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

January 1 - March 31, 1971

System	Specific Conductivity umhos	pH at 25° C.	Conc. - ppm			Gross Gamma (1) 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	1200-1600	8.50- 9.70	503-627	-	-	Bkgd-19 ± 10
Coolant Charging Water Specifications	2.50 max. (2)	6.00-8.00	none	0.1 ppm max.	none (3)	none
Observed	1.90-5.70	7.22-8.80 (2)	-	<0.05	9.10	-
Canal Water Specifications	5.00 max	6.00-8.00	none	none	none	none (4)
Observed	1.30-1.80	6.00-6.76	-	-	-	Bkgd-21 ± 8

- (1) Multiply tabular value by 4.55×10^{-7} to obtain uc/ml
 (2) The out of specifications pH and Specific Conductivity resulted from NH₄OH from reactor coolant additions making its way to the Primary Water Storage Tank.
 (3) Should be < 0.14 ppm for reactor plant cold shutdown
 (4) Normally near background

TABLE IV
Primary System Resin and Crud Analysis

EFPH	In Service		Out Service		Type Sample	Volume Coolant Liters	Crud Weight mg	Resin Weight gms.	Sp. Act.* cpm/mg @ 120 hrs.	Activity dpm/mg at 120 hr. **							% Acc
	Date	Time	Date	Time						Co ⁶⁰	Co ⁵⁸	Fe ⁵⁹	Cr ⁵¹	Mn ⁵⁴	Hf ¹⁸¹	Zr ⁹⁵	
950	8/18/69	1400	9/19/69	1400	Crud	437	1.61		$\times 10^7$	$\times 10^6$	$\times 10^6$	$\times 10^5$	$\times 10^5$	$\times 10^5$	$\times 10^5$	$\times 10^4$	91
1690	12/8/69	1200	12/10/69	1200	Crud	873	1.78		2.30	31.6	1.30	100	1.72	13.0	0.002	0.113	96.7
2445	2/12/70	1000	2/13/70	1000	Crud	437	0.13		2.64	31.2	31.2	241	37.4	13.9	1.56	15.5	91.3
3814	8/25/70	0925	8/26/70	0925	Crud	437	2.25		9.69	97.5	120	52.6	208	45.8	10.7	87.5	94.1
									2.67	37.7	22.8	11.8	39.0	14.6	1.5	4.1	
950	9/18/69	1400	9/19/69	1400	Resin	219		50.1	$\times 10^4$	$\times 10^4$	$\times 10^4$	$\times 10^3$	$\times 10^2$	$\times 10^3$			25
1690	12/8/69	1200	12/10/69	1200	Resin	437		42.5	0.017	0.007	0.004	0.002	0.018	0.012			94.1
2445	2/12/70	1000	2/13/70	1000	Resin	129		42.7	56.9	74.1	46.7	13.1	407	181			67.2
3814	8/25/70	0925	8/26/70	0925	Resin	219		= 42.5	29.4	32.0	15.4	11.0	47.4	16.2			92.9
									51.5	95.7	8.5	7.8	80	133			

* 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}

Chemistry

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TABLE V
1000 Hour Fission and Activation Product Analysis
Core 2 Seed 2

1000 Hour Run Number & (EFPH)	Cs 137 dpm/ml (1)	I 131 dpm/ml (1)	I 133 dpm/ml (1)	Xe 133 dpm/ml (1)	Ar 41 dpm/ml (1)
(1) 950	non-dect.	4.2	104	29	1.43×10^4
(2) 1690	non-dect.	3.2	87	98	4.44×10^4
(3) 2445	non-dect.	5.2	76	84	3.37×10^4
(4) 3814	non-dect.	6.9	199	57	4.22×10^4

(1) Multiply tabular value by 4.55×10^{-7} to obtain uc/ml

TABLE VI

Operating Heat Exchanger Chemistry

Water Chemistry

January 1 - March 31, 1971

Water Conditions	Specifications	Operating Heat Exchangers			
		1A	1B	1C	1D
1. Dis. Salts - ppm	Min. --- Max. 1000	60 145	44 162	58 160	60 143
2. Phosphate - ppm	Min. 5 Max. 100	28 98	24 98	32 98	32 82
3. Chloride - ppm	Min. 0 Max. 0.5	.23 .45	.21 .45	<0.05 .48	0.23 0.45
4. Hydrazine - ppm	(residual)	0.021- 0.089	0.015- 0.089	0.033- .15	.013- .083
5. Silica - ppm	Min. 0 Max. 25	2.8 5.42	1.9 5.12	3.1 7.1	1.68 5.30
6. pH at 25° C	Min. 9.50 Max. 11.00	9.62 10.48	9.33 (1) 10.90	9.45 (1) 10.55	9.60 10.50
7. Chemicals Used, lbs. Na ₃ PO ₄ Na ₂ HPO ₄ NaH ₂ PO ₄		23.5 3.5	26.5 4	19 2	19 3.5

(1) Low pH due to dilution. Failed to treat the day before in anticipation of revised boiler chemistry.

Table VII

Non-Operating Heat Exchangers

Water Chemistry

January 1 - March 31, 1971

Chemistry

Water Conditions	Specifications	Non-Operating Heat Exchangers			
		1A	1B	1C	1D
1. Dis. Salts - ppm	Min. --- Max. 1000	68 153	50 156	62 157	81 153
2. Phosphate - ppm (Hot Lay-up)	Min. 5 Max. 100	42 103 ⁽¹⁾	28 98	36 98	46 98
(Cold Lay-up)	Min. --- Max. ---	56 84	58 90	40 84	66
3. Chloride - ppm	Min. --- Max. 0.50	< .05 .40 ⁽²⁾	0.05 .40 ⁽²⁾	0.05 0.40 ⁽²⁾	0.20 0.38
4. pH @ 25°C.	Min. 10.00 Max. 11.00	9.90 10.66	9.78 10.67	9.76 10.71	10.03 10.58
5. Hydrazine - ppm (Hot Lay-up)	Min. Residual Max. ---	0.002 43	0.004 23	0.006 23 ⁽³⁾	0.003 0.29
(Cold Lay-up)	Min. 50 Max. 100	55 60	54 90	46 60	83
6. Chemicals Used (Pounds)					
Na ₃ PO ₄		5.5	28	4.5	6
Na ₂ HPO ₄		5	12	6	2.9
NaH ₂ PO ₄		15	20	15	16
N ₂ H ₄			.5	.5	

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- (1) High phosphate due to overtreatment.
- (2) Low pH due to dilution from water addition. Another reading of 9.80 on 1B and 1C occurred during the quarter due to the same reason.
- (3) Low hydrazine due to sampling before mix achieved following treatment for cold layup.

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 summarized as follows:

C Loop 18" Manual Stop Valve

Repair of 1C Loop 18" Manual Stop Valve, which had been undertaken during the previous quarter, was completed during the present quarter. The defective area was ground out, welded and liquid penetrant inspected. The loop was returned to service on January 17.

1C Reactor Coolant Pump

Main flange bolts on 1C Main Coolant Pump were retorqued as a result of leakage noticed on the casing while the manual stop valve was being repaired. Main flange bolt number thirteen was replaced and the loop was then returned to service on January 17.

Reactor Pit Sump Pump

Reactor pit sump pump was overhauled due to a broken shaft.

1A and 1B Component Cooling Water Pumps

1A and 1B component cooling water pumps were overhauled for preventive maintenance.

1A Reactor Plant Container Drainage Pump

1A reactor plant container drainage pump was overhauled for preventive maintenance.

1D Steam Generator

Before the plant shutdown in February, an increase in the 1D steam generator leak rate resulted in removing the 1D reactor coolant loop from service. The leaking tube was located and later verified by eddy current testing. Five (5) additional tubes were plugged with disc plugs on the inlet end at the end of the report period.

1D Reactor Coolant Pump

With the shutdown of 1D reactor coolant loop, the 1-D Reactor Coolant Pump was opened to permit manual rotation of the pump during the time the loop was out of service.

Spare Valve Operating System Air Compressor

The spare valve operating system air compressor was overhauled for preventive maintenance.

Radioactive Waste Disposal System Modifications

During the quarter, modifications were done to the Radioactive Waste Disposal system. The resin in the ion exchangers was changed, a booster pump was added before the pre-filter and sub-micron filter, and an ion exchanger was connected to the outlet of the evaporator.

Radioactive Waste Disposal Evaporator Feed Pump

The mechanical seals in the evaporator feed pump were replaced due to leakage.

Continuous Air Monitors

Continuous air monitor air flow meters were calibrated, rate meters were inspected and repaired and air inlet pipes were also installed to sample the air approximately five feet above the floor level.

Drumming Station in Fuel Handling Building

A drumming station was erected in the Fuel Handling Building for compacting contaminated rubbish to eliminate the hazard of air-born contamination.

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 primary plant temperature, pressure and flow instrumentation. Tests were also performed to check the operation of the FEDAL System, Nuclear Protection System, Axial Flux Measurement System, and control rod drive mechanisms. Reactor physics tests were performed during the scheduled station shutdown of February 12 through March 10. Radiation surveys were taken on the reactor vessel head and reactor coolant loops and purification demineralizers. The reactor plant container integrity was checked at the butterfly valves.

Thirty-seven test performances were conducted during this report period. Thirty-five tests were completed and two remained in progress at the end of the quarter. Table VIII lists these tests and Figure 2 displays the performance dates. Information pertaining to chemistry tests may be found in the chemistry section of this report.

The Reactor Plant Container Integrity was checked at the butterfly valves (DLCS 56802) on February 22, 23 and 26. Acceptable response times and leak rates were obtained for both the supply and exhaust valves. The 1A Boiler Compartment hatch cover bolts (DLCS 56804) were checked and found to be within specified torques on February 25.

A radiation survey of the 1BD purification demineralizer (DLCS 58502) was performed on January 14 and the reactor vessel head was surveyed (DLCS 58601) on February 14. Radiation surveys were performed on all the reactor coolant system piping and components (DLCS 58501) on February 14 and 15.

Radioactive Waste Disposal Micron Filter Evaluation (DLCS 59802) was performed using three different size filters between January 4 and March 8.

The Periodic Intercalibration of Temperature Sensing Elements (DLCS 60901) was performed February 14, 19 and 27 and between March 1 and 8. The platinum resistance bulbs were calibrated. They were then installed in the 1A, 1B, 1C and 1D reactor coolant loops and pressurizer on March 1. Pressurizer level wide and narrow range indicators (DLCS 61201) and 1A, 1B, 1C and 1D reactor coolant loop flow instruments (DLCS 61301) were calibrated on February 23 and 25 and February 27, 28 and March 1 respectively. Calibration of the Pressurizer Pressure (NR) instrumentation (DLCS 61001) was performed February 9. All of the above calibrations were performed in conjunction with the calibration of the Data Acquisition System (DLCS 60401).

The results of the February 15, Comparison of Reactor Plant Pressure Instrumentation at Operating Pressure and Temperature (DLCS 61002) revealed that all of the Reactor Plant Pressure Instrumentation compared favorably with the recently calibrated Pressurizer Pressure (NR) instrument.

The Reactivity Loss Rate Coefficient Test (DLCS 64001) was performed February 10, 11 and 12. A Temperature Coefficient of Reactivity at Power (DLCS 63401) of approximately $-2.4 \times 10^{-4} \Delta\rho/^{\circ}\text{F}$ was determined on February 12 with the reactor operating at 67.2 percent power and 4931.7 EFPH accumulated on Core 2 Seed 2. On February 14 the reactor was shutdown from 67.2 percent power with 4936.7 EFPH accumulated on Core 2 Seed 2 and Xenon Transient (DLCS 63301) was performed. Peak xenon and return time was determined to have occurred approximately 7 hours and 18 hours, respectively, following shutdown.

The core axial flux was measured for power range, equilibrium xenon conditions (DLCS 63502) on February 10 through 12. Iron-manganese wires were irradiated for five minutes at 67 percent reactor power. On February 12 and 13, zircaloy wires were irradiated for 20 minutes at both peak xenon and the return time for measurement of the axial flux during the Xenon Transient (DLCS 63503).

The Nuclear Protection System checkouts (DLCS 60801 and 60802) were performed February 28 and March 8 and 9 respectively. The control rod drive mechanisms were successfully tested at operating temperature (DLCS 66101) on March 5 and 6. Control Rod Position for Criticality at Operating Temperature (Critical Bank Height and Bank Worth Measurements) (DLCS 63701) was performed on March 9 and 10 prior to the station startup.

The FEDAL System Operation during Station Startup (DLCS 58302) was performed on January 17 and on various dates throughout March.

TABLE VIII
Test Performed During First Quarter of 1971

DLCS	5680213	Reactor Plant Container Integrity Test (Butterfly Valve Test)
DLCS	5680403	Reactor Plant Container Integrity Test
DLCS	5850131	External Radiation Levels of Reactor Coolant System
		Piping and Components and Purification System
		Demineralizers and Heat Exchangers
DLCS	5850211	Radiation Survey of the Demineralizers
DLCS	5860115	Periodic Radiation Survey of the Reactor Vessel Head
DLCS	5980201	RWD Micron Filter Evaluation (Special Test Procedure)
DLCS	6040113	Data Acquisition System Calibration Test
DLCS	6080106	Nuclear Protection System (Checkout High Th and P/F Circuitry)
DLCS	6080206	Nuclear Protection System (Checkout Pump Power, SLOFA and CLOFA Circuitry)
DLCS	6090113	Periodic Intercalibration of Temperature Sensing Elements
DLCS	6100110	Periodic Calibration of Pressure Instrumentation
DLCS	6100202	Comparison of Reactor Plant Pressure Instrumentation at Operating Pressure and Temperature
DLCS	6120107	Periodic Calibration of Pressurizer Level Instrumentation
DLCS	6130112	Periodic Calibration of Reactor Plant Flow Instrumentation
DLCS	6330112	Xenon Transient Test
DLCS	6340110	Temperature Coefficient of Reactivity at Power
DLCS	6350225	Axial Flux Measurement Test (Power Range - Equilibrium Xenon)
DLCS	6350311	Axial Flux Measurement Test (Xenon Transient)
DLCS	6370110	Control Rod Position for Criticality at Operating Temperature (Critical Bank Height and Bank Worth Measurements)
DLCS	6400111	Reactivity Loss Rate Coefficient
DLCS	6610107	Control Rod Drive Mechanism Periodic Test
DLCS	5830206-19	FEDAL System (Operation During Station Startup)

Tests Remaining In Progress At End of Report Period

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

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
FMI	flow measurement instrumentation
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

Glossary

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RC	resistance capacitance
uc	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