DLCS 5000175

DUQUESNE LIGHT COMPANY
Shippingport Atomic Power Station

Quarterly

OPERATING REPORT

MASTER

First Quarter
1975

Contract AT-11-1-292

United States Atomic Energy Commission

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QUARTERLY OPERATING REPORT
First Quarter 1975
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Approved By:

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

1. SUMMARY OF OPERATIONS

During the first quarter of 1975, the Shippingport Atomic Power Station remained shutdown for PWR/LWBR (Pressurized Water Reactor/Light Water Breeder Reactor) Core Conversion. At the beginning of the quarter the 1A, 1C and 1D loops remained isolated from the reactor and on head tank pressure through their respective fill valves. On February 16, the 1A loop primary side was drained and the 1A coolant pump placed under a nitrogen purge on February 18. The 1D loop primary side was drained and the 1D coolant pump placed under a nitrogen purge on February 24. The 1A and 1D loops remained in a dry layup condition for the remainder of the period for heat exchanger removal preparation. The BD Core Removal Cooling System remained in service on the 1B loop. The 1B, 1C and 1D Steam Generators (S/G) Secondaries remained in cold, wet layup condition and the 1A S/G Secondary remained in a partial drain condition. On February 26, the 138 KV power source was transferred from the normal source to the Number 1 Main Unit Transformer to backfeed the plant during transformer relay protection modifications.

Defueling operations continued throughout the quarter. A nitrogen purge of the upper reactor vessel was initiated on January 3, and then on January 10, the reactor vessel water level was lowered to a level between elevation 706'9" and 707'2". This level has been maintained the remainder of the quarter. The RWD gaseous waste system remained vented to atmosphere throughout the first quarter report period.

During the first quarter of 1975, 2150 cubic feet of radioactive solid waste was shipped off-site for burial. These shipments contained 0.073 curie of radioactivity.

2. SUMMARY OF CORE 2 STATION PERFORMANCE

Electrical output (Gross) to date	kwhr	3,476,592,300
EFPH to date (Blanket operating time).	hr	23,812.0
EFPH to date (Seed 2 operating time).	hr	10,160.0
EFPH for the quarterly period	hr	0
Hours reactor critical to date	hr	62,232.7
Hours reactor critical for the quarterly period. . .	hr	0
No. 1 main unit service hours (quarterly period) . .	hr	0
Net Station output (quarterly period)	kwhr	0
No. of forced outages*		0

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

3. CHEMISTRY

During the first quarter of 1975, the chemistry section maintained specifications in the various plant systems and fulfilled station manual requirements.

Reactor Plant

Since the reactor was shutdown the entire quarter, all four reactor coolant loops and the AC and BD purification demineralizers remained out of service. The only out-of-specification reactor coolant chemistry condition this quarter was that of high dissolved oxygen values due to non-deaerated make-up water from the primary water storage tank. See Table I. The only out-of-specification conditions in the reactor plant auxiliary systems were low pH values in the canal waters and high dissolved O_2 values for the coolant charging water. The low pH values for the canal waters were a result of insufficient recirculation. The high dissolved O_2 values for the coolant charging water were the result of non-deaerated water being pumped to the primary water storage tank during operating periods when there are no dissolved O_2 specifications on the charging system. See Table III.

Turbine Plant

The Station has been shutdown the entire quarter. The 1A, 1B, 1C and 1D heat exchangers have been on cold lay-up the entire quarter. The only out-of-specification condition experienced during this quarter was high conductivity in the 1A heat exchanger. The high conductivity was attributed to ammonia forming from hydrazine decomposition. See Table II.

Radioactive Waste Disposal System

The total radioactivity, exclusive of tritium, discharged from Shippingport during the quarter was approximately 0.000045 curie, which is only 0.003% of the allowable limit. The quantity of 0.002 curie of tritium was an insignificant 0.0002% of the allowable limit. These radioactivity releases from Shippingport are far too small to have any measurable effect on the general background environmental activity outside the plant.

TABLE I

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

Chemical Conditions	Specifications	Analytical Results	
		Min.	Max.
Oxygen-ppm Max.	0.14	0.007	0.88**

** See Reactor Plant Section of QOR.

TABLE II

Non-Operating Heat Exchangers
Cold Lay-up
Water Chemistry

Water Conditions		Specifications	Non-Operating Heat Exchangers			
			1A	1B	1C	1D
1. Conductivity	Max.	30	48*	23	23	23
	μmho/cm					
2. pH @ 25°C	Min.	9.50	10.04	9.64	9.63	9.65
	Max.	10.50	10.35	10.10	10.13	10.11
3. Chloride-ppm	Max.	0.05	<0.05	0.08	<0.05	<0.05
4. Hydrazine-ppm	Min.	50	53	50	50	51
	Max.	100	94	83	83	82
5. Chemicals Used in lbs.						
N ₂ H ₄			6.25	6.00	6.00	6.00
C ₄ H ₉ NO			--	--	--	--

*See Turbine Plant Section of QOR

TABLE III

Reactor Plant Auxiliary System

Water Conditions

System	Conductivity $\mu\text{mhos/cm}$	pH at 25°C	Conc. - ppm			Gross Gamma* Activity - dpm/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	1260 - 1600	8.36-9.51	507-631	<0.05-0.14	N.P.	<MDA*-0.99
Coolant Charging Water Specifications	2.50 max.	6.00-8.00	N.S.	0.1 ppm max.	Note**	N.S.
Observed	0.91-1.1	6.48-6.72	N.P.	<0.05	0.00-1.20**	N.P.
Canal Water Specifications	5.00 max.	6.00-8.00	N.S.	N.S.	N.S.	N.S.
Observed	0.45-0.99	5.83***-7.36	N.P.	N.P.	N.P.	<MDA*-0.84

* Multiply tabular value by 4.50×10^{-7} to obtain $\mu\text{c/ml}$; MDA = 0.4 dpm/ml.

** Should be <0.14 ppm for reactor plant cold shutdown. See Reactor Plant Section of QOR.

*** See Reactor Plant Section of QOR.

N.S.: No limit needed, therefore, no limit has been specified.

N.P.: Analysis is not necessary and not performed.

4. MAINTENANCE

Repairs of major components, as well as routine maintenance of equipment instruments, controls and preventive maintenance were performed during this quarterly report period. Major work items completed or in progress during this period are summarized as follows:

Main Unit Turbine

The internal and external components of the Main Unit Turbine remain at the Westinghouse Electric Corporation Turbine Repair Center at Lester, Pennsylvania for overhaul as a result of the turbine failure on February 4, 1974.

Main Unit Generator

The inspection and repair of the Main Unit Generator Rotor was completed and the unit was shipped to Duquesne Light Company's Phillips Power Station for storage.

Main Condensate Pumps

A general overhaul and inspection was performed on the A and B Main Condensate Pumps.

Condenser Retubing

Preparations were made for retubing the Main Unit Condenser and the replacement tubes were received during this quarter.

Station Decontamination

A station wide decontamination program was initiated during this quarter.

RWD Evaporator

Repairs of leaks in the Radioactive Waste Disposal Evaporator were made.

Main Coolant Pumps

Work was performed on the 1A, 1B, 1C and 1D Main Coolant Pumps in preparation for an inspection of the upper radial bearings and stator cans.

Steam Generators

The replacement of the 1A Main Steam Generator began during the first quarter. The new 1A and 1D Main Steam Generators were also received via railroad.

Upper Core Barrel

The Upper Core Barrel for the LWBR which was shipped via railroad was received during this quarter.

PWR Defueling

Defueling efforts continued in the area of the reactor vessel head. Cutting of the mechanism seal welds and removal of the mechanisms were completed. The flux thimbles and thermocouples were cut and removed during the quarter and the center port seal weld was cut. Other work completed was the removal of the multi-port valve, core support flange nozzles, FEDAL bypass piping and lower stud nuts.

5. TEST PROGRAM

The Station was shutdown throughout the entire first quarter of 1975 and no formal testing was performed. A special test procedure DLCS 70401 (Test Operation of the 1A Reactor Coolant Pump in Isolated Loop During Refueling) was performed on February 9 through 12, 1975 to obtain information relative to the condition of the 1A Reactor Coolant Pump thrust runner graphitar shoes.

6. 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
EFPH	equivalent full power hour
ERDA	Energy Research and Development Administration
FEDAL	Failed Element Detection and Location System
Hc	critical height
HDS	Heat Dissipation System
magamp	magnetic amplifier
MDA	Minimum Detectable Activity
MELBA	Multipurpose Extended Life Blanket Assembly
mr	milliroentgen
mrem	milliroentgen equivalent man
NPS	Nuclear Protection System
ORMS	Operational Radiation Monitoring System
PWR	Pressurized Water Reactor
R	roentgen
RC	resistance capacitance
µc	microcuries

Glossary

DLCS 5000175

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 inlet coolant temperature
Th	reactor outlet coolant temperature
Ts	time of sample isolation
v/o	percent by volume
VOS	Valve Operating System