MASTER

DUQUESNE LIGHT COMPANY
SHIPPINGPORT ATOMIC POWER STATION

TEST RESULTS

DLCS 1800102
T-612085

CHARGING AND DISCHARGING OF DEMINERALIZER RESINS

CORE 1 SEED 2

Section 1 of 6 Sections

First Issue, January 10, 1961

LEGAL NOTICE

This report was prepared as an account of Government sponsored work. Neither the United States, nor the Commission, nor any person acting on behalf of the Commission:

A. Makes any warranty or representation, expressed or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this report, or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately owned rights; or

B. Assumes any liabilities with respect to the use of, or for damages resulting from the use of any information, apparatus, method, or process disclosed in this report.

As used in the above, "person acting on behalf of the Commission" includes any employee or contractor of the Commission, or employee of such contractor, to the extent that such employee or contractor of the Commission, or employee of such contractor prepares, disseminates, or provides access to, any information pursuant to his employment or contract with the Commission, or his employment with such contractor.

RELEASE APPROVED — AUTHORIZATION ON
FILE IN RECEIVING SECTION.

096

01

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

TEST RESULTS

DLCS 1800102
T-612085

CHARGING AND DISCHARGING OF DEMINERALIZER RESINS

CORE I SEED 2

Purpose

To flush the LBD Coolant Purification System demineralizer of resin and to measure the radiation level at points on the resin discharge line.

Conclusions

The LBD Coolant Purification System demineralizer was satisfactorily flushed of resin as indicated by the radiation levels observed along the discharge line. It was not possible to determine if the demineralizer was completely free of resin. The amount of resin removed from the LBD demineralizer will be available after the volume of resin required to charge the demineralizer has been obtained.

Description of Test Equipment and Test Procedure

The resin in the LBD Coolant Purification System demineralizer was flushed to the resin storage tanks in the Radioactive Waste Disposal System in accordance with the normal operating procedure described in Volume I, Chapter 41, "Coolant Purification System", General Operating Guide. The valving arrangement used to flush the demineralizer permitted head tank pressure from the Primary Water Storage Tank to flush the resin to the Resin Storage Tank prior to starting the fill pump. A portable survey meter and probe was used to measure the activity at the piping bend directly below the demineralizer and at the resin discharge valve (09-H16-22). A probe was also located one foot upstream from three way valve (43-H16-159) in the resin discharge line. Three Jordan portable survey meters were used to measure the activity level before, during and after the flushing operation.

Results

DLCS 1800102, Charging and Discharging of Demineralizer Resins, was performed on June 17, 1960. The rising and subsequent falling of the radiation levels along the resin discharge line was indication that the resin was flushed from the LBD demineralizer. Primary water storage tank head pressure was applied to the demineralizer prior to starting the fill pump. It was found that this pressure was sufficient to force the resin out of the demineralizer.

TEST RESULTS DLCS 1800102

T-612085

CHARGING AND DISCHARGING OF DEMINERALIZER RESINS

An increase in the 1B and 1A Resin Storage Tank liquid levels of 13% and 22% respectively, indicates that approximately 1840 gallons of water and resin were used in the flushing operation. The fill pump flow indicator was out of service during the test.

Fill pump discharge pressure, radiation activity levels and tank level data are tabulated in Table I. The activity levels show that the resin or at least part of it was forced from the demineralizer before the fill pump was turned on.

With the fill pump operating, an attempt was made to switch the three way valve (43-H16-159) from the 1B to the 1A Resin Storage Tank. With a sudden stopping of the flow, the resin compacted against the valve when it was in the "BLOCK" position. An attempt to move the valve from this position resulted in breaking the valve handle. The pump was turned off and the valve was moved to the "1A RESIN STORAGE TANK" position by using a wrench on the valve stem. The resin was then compacted in the discharge line. Repeated operation of the fill pump finally dislodged the resin. The resin discharge line was observed to vibrate considerably during this operation. A revision is being made to the Operating Procedure to require that the fill pump be shut off prior to operation of the three way valve.

The calibration data for the Jordan survey meters are tabulated in Table II.

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

CHARGING AND DISCHARGING OF
DEMINERALIZER RESINS
DLCS 1800102 (T-612085)

TABLE I

TEST DATA

Time	Fill Pump Discharge Pressure psi	Radiation Level At Pipe Bend mr/hr	Radiation Level At Discharge Valve mr/hr	Radiation Level At Waste Disposal Valve mr/hr	1B Resin Tank Level %	1A Resin Tank Level %	Remarks
1020				<0.5	53		
1025		350	12				
1116		1500	900				
		1200					
1117		2000	1000	80			
		2300	1300				
		2500	800				
1119				500			
				600			
1120		1900	1700	1000			
1120:30		1500	1200				
1121		700	500	1750			
1122		400	130	2000			
1122:30	134						Fill pump on.
1123		380	120	1900			
				2100			
1123:30	135						
1124				100			
1124:30	136						
1125		350	90				
1125:30	136						
1126		350	100				
1126:15							Switching from 1B to 1A resin tank. Valve handle on 43-H16-159 broke when valve was in the blocked position

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATIONS

CHARGING AND DISCHARGING OF
DEMINERALIZER RESINS
DLCS 1800102 (T-612085)

TABLE I (cont'd)

TEST DATA

Time	Fill Pump Discharge Pressure psi	Radiation Level At Pipe Bend mr/hr	Radiation Level At Discharge Valve mr/hr	Radiation Level At Waste Disposal Valve mr/hr	1B Resin Tank Level %	1A Resin Tank Level %	Remarks
1126:30	149						
1127		350	90		66		Large vibration at deminer- alizer discharge pipe. Fill pump off.
1127:10	28					35	
1135				20			
1144				14			Valve 43-H160159 open at 1A Resin Tank.
1145:10	149						Fill pump started.
1146		350	120				Large vibration at deminer- alizer resin discharge pipe.
1146:10	149						
1147:10	149						
1148		350	120				Large vibration at deminer- alizer resin discharge pipe.
1148:10	149						
1149:10	149						Starting and stopping pump to break resin block.
1149:45							Fill pump off.
1321				11			Fill pump on.
1322				18			
1323				10			
1324				10		57	Fill pump off.

096 05

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

CHARGING AND DISCHARGING OF
DEMINERALIZER RESINS
DLCS 1800102 (T-612085)

TABLE II
CALIBRATION DATA

Jordan Meter 29-S6-669
Calibrated June 9, 1960
Source - Cobalt⁶⁰, 38 μ curie

Location: Pipe Bend

Source	mr/hr	5	10	25	50	100	250	500	1000	1500
Measured	mr/hr	5	10	26	52	100	250	500	1000	1500

Jordan Meter 29-S6-668
Calibrated June 10, 1960
Source - Cobalt⁶⁰, 38 μ curie

Location: Resin Discharge Valve (09-H16-22)

Source	mr/hr	5	10	25	100	250	500	1000	1500
Measured	mr/hr	5	10	26	100	250	500	1000	1500

Jordan Meter 29-S6-17
Calibrated June 10, 1960
Source - Cobalt⁶⁰, 38 μ curie

Location: Three Way Valve (43-H16-159)

Source	mr/hr	5	10	15	25	50	100	250	500	1000	1500
Measured	mr/hr	5	10	17	28	53	100	245	500	1000	1500

TEST RESULT DLCS 1800102

T-612085

AGING AND DISCHARGING OF DEMINERALIZER RESINS

Results Prepared By Donald L. Skidmore

Results Reviewed By Thomas Liberry

Approved (Duquesne Light Company)

J. Jones

Date

1/10/61