MASTER

DUQUESNE LIGHT COMPANY
SHIPPINGPORT ATOMIC POWER STATION

TEST RESULTS

DLCS 1560109
T-612081

XENON TRANSIENT TESTS

CORE I SEED 2

EFPH 1565.4

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TEST RESULTS

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XENON TRANSIENT TESTS

CORE I SEED 2

Purpose

The purpose of this test is to determine if there is sufficient excess reactivity present in the core to override a peak xenon transient and to obtain data for rod worth calculations.

Conclusions and Recommendations

Upon completion of 1565.4 EFPH of plant operation of Core I, Seed 2 (7371.5 EFPH total Core I operation) there was sufficient reactivity to override the peak xenon transient imposed by a rapid Station shutdown from an average reactor power level of 102.65 per cent. The override occurred 8 hours and 46 minutes after shutdown with Group I control rods (1's, 3's, 5's and 7's) withdrawn to 69 inches and Group II control rods (2's and 6's) controlling, withdrawn to 44.75 inches. Rod Group III (4's) and Group IV (8's) were fully inserted.

It is recommended that DLCS 15101, Determination of Temperature and Pressure Coefficients be run for each performance of DLCS 15601, Xenon Transient Test, in order to have substantiated, current values for temperature and pressure corrections for use in the preparation of results for DLCS 15601, Xenon Transient Tests.

Description of Test Equipment and Test Procedure

The test was performed in accordance with the ninth issue of the Test Procedure for DLCS 15601, Xenon Transient Tests, dated August 12, 1960.

Equilibrium xenon was established prior to shutdown by operating the plant at approximately 65 MW gross electrical output for 120 hours with all reactor coolant pumps on FAST speed. The power level was logged for 40 hours prior to the shutdown.

The turbine plant was shut down at 0824 hours on August 13, 1960, as specified in DLCS 344, Rapid Station Shutdown, and the neutron flux level was reduced to 1×10^{-10} amperes on the Intermediate Range Nuclear Instrumentation. The reactor was maintained at this level until the initial rapid rate of xenon buildup had decreased enough to permit start-up rate measurements. When start-up rate measurements could be obtained, the controlling group rods were withdrawn and inserted as necessary for each series of start-up rate measurements. The xenon transient was followed in this manner for 40 hours.

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A Brown recorder was connected through a Keithly micro-micro ammeter to the D Channel of the Nuclear Instrumentation System. The change in neutron flux level was observed on the Brown recorder. For the start-up rate measurements a stop watch was used to measure the time required for the flux level to increase by a factor of 2.72 (e). This time in seconds is the measured reactor period.

Results

DLCS 1560109, Xenon Transient Tests, was performed on August 13, 14 and 15, 1960.

The original data obtained during the test, together with any necessary correction factors and calculations for their application, are presented in Tables II through VII. Table I summarizes these original data and the calculations required to convert these data into corrected reactivity for a specific rod height. Table II contains the data obtained prior to shutdown. The average power level for the forty hours prior to shutdown indicates the reactor was operated at 102.65 per cent of full power.

During each run several period measurements were made in order to obtain a realistic figure for the reactor period by using the average value of these measurements. The mean time for each run in Table I is the mean between the time for the start of the first period measurement and the time for the end of the last period measurement. The average temperature for each run was obtained from the precision resistance thermometers which are read on Mueller recording bridges. This was accomplished by obtaining the resistance, at the mean time for the run, for each loop in service. These resistances were then converted to temperatures using platinum resistance versus temperature conversion tables. The temperatures were then corrected using the calibration information for each resistance thermometer that was obtained on March 23, 1960. The corrected temperatures were then averaged and used for the value of reactor coolant temperature during each run. The original data and corrections for these temperatures are presented in Table III.

In order to obtain the average pressure for each run as listed in Table I, the individual loop pressures were obtained once during the run for each loop in service. The corrections obtained from the calibration of the loop pressure instrumentation (DLCS 3360101, Calibration of Pressure Instrumentation performed in April 1960) were applied to each pressure reading. The average of these corrected loop pressures was used as the average reactor coolant pressure during each run. The original data and calculations for the pressures are listed in Table IV.

The controlling group rod height for each run listed in Table I was measured by establishing a control rod height prior to the first run. The rod drive motor inverter face plates were graduated in 0.001 inch increments with a total of 0.25 inches per revolution. The graduations were used to precisely measure the change in height from the height established prior to the first run. The coarse measurements were made using the control rod position indicators. The rod positions for each run were obtained in this manner and are listed, together with the inverter face plate readings, in Table VII.

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A stop watch was used to measure the reactor periods by determining the time required for the reactor power to increase by a factor of 2.72 (e), as indicated on the Brown recorder. Several period measurements were made during each run and these were converted into terms of reactivity using a set of tables based on the inhour equation using a delayed neutron fraction of .0064. Table I gives these values for each run as well as the average reactivity for the runs.

Since the Reactor Coolant System temperature and pressure could not be held constant during the test the average reactivity for each run was corrected to a Reactor Coolant System temperature and pressure of 500 F and 1800 psig respectively. The values of ΔT and ΔP listed in Table I are the corrections, and the direction in which they must be applied, to bring the actual plant operating conditions to the base values of 500 F and 1800 psig.

The pressure coefficient used to make the reactivity corrections was $+ 2.50 \times 10^{-6} \Delta p/\text{psi}$ and the temperature coefficient was $- 1.8 \times 10^{-4} \Delta p/\text{F}$. These values were based on values obtained from DLCS 1510109 which was performed April 20, 1960. The pressure coefficient was used as obtained but the temperature coefficient was adjusted for core depletion by decreasing the measured value of $- 2.20 \times 10^{-4} \Delta p/\text{F}$ to $- 1.8 \times 10^{-4} \Delta p/\text{F}$. The use of this value for temperature coefficient cannot be substantiated by test data and is merely an estimate based on past test experience.

A more specific approach to a current temperature coefficient for use with this test in future performances would be to perform DLCS 15101, Determination of Temperature and Pressure Coefficients of Reactivity, at 500 F, 1800 psig and zero power just following each performance of DLCS 15601, Xenon Transient Tests.

The reactivity corrections for temperature and pressure were applied as required and the corrected value of reactivity for each run is presented in Table I. The time of criticality listed for each run in this Table was obtained by plotting the corrected reactivity for each run against the mean time for the run, in terms of hours after station shutdown, for each rod height. A straight line extrapolation was made to the time of zero reactivity and this time was considered to be the time of criticality for that particular rod height.

The individual loop flows, for the loops in service, were recorded during each run as required by the test procedure. Since the 1A and 1D loop flow indicators were out of service during the test the 1A and 1D reactor coolant pump differential pressures were recorded. The differential pressures were not converted into values for loop flows because the data was not used in the analyses of the results. The original data for the flows and differential pressures are presented in Table V.

Figure 1 is a sample plot of corrected reactivity, ρ , versus time using the data in Table I for runs 131 through 138. A sample calculation for obtaining rod worth from this plot is shown on this figure. This method was used to calculate rod worth at various rod heights as the transient progressed and these values of rod worth versus rod height are plotted graphically on Figure 2. The total reactivity at various rod heights was obtained by integrating areas under the

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rod worth curve between various rod heights. The integrated areas between rod heights are tabulated in Table VI and plotted in Figure 3 to show the total rod worth curve obtained for this test.

Figure 4 is a plot of reactivity, ρ , versus time during peak poisoning. For a constant rod height, the reactivity, ρ , will be a minimum at maximum xenon poisoning. Thus, the time at which peak xenon poisoning occurred can be found from the plots on Figure 4. The time at peak was 8 hours and 46 minutes after shutdown.

Figure 5 is a curve of critical bank height versus time after shutdown. Group II (2's and 6's) control rods were used to maintain criticality during the first 37 hours of the test with Group I (1's, 3's, 5's and 7's) at 69 inches and Group III (4's) and Group IV (8's) completely inserted. During the last 3 hours of the test (from 37 to 40 elapsed hours from shutdown) the Group I rods (1's, 3's, 5's and 7's) were used to maintain criticality and Groups II, III and IV rods were completely inserted.

The average bank height of Group II rods at the time of shutdown with equilibrium xenon was 19.25 inches. At maximum poisoning the Group II rods were withdrawn to 44.25 inches to maintain criticality.

Figure 6 is a plot of total reactivity versus time after shutdown. The points were determined by using Figures 3 and 5 and show the variation of the negative reactivity in the core during the transient due to total poisoning but primarily caused by the xenon transient.

TABLE I

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Date	Run No.	Mean Time	Avg. Temp. F	Avg. Press. psig	Average Rod Height 2's and 6's Inches	Reactor Period Sec.	Uncorrected Reactivity $\rho \times 10^{-4}$	Average Uncorrected Reactivity $\rho \times 10^{-4}$	Reactivity Corrections To 500 F and 1800 psig				Corrected Reactivity $\rho \times 10^{-4}$	Criticality Time
									ΔT F	Temp. $\Delta \rho \times 10^{-4}$	ΔP psig	Press. $\Delta \rho \times 10^{-4}$		
8/13/69	1	1225	499.5	1801	38.45	38.3 42.6 45.7	12.476 11.651 11.126	11.751	0.5	- 0.90	- 1	- 0.025	10.826	1243
	2	1234	499.7	1804	38.45	100.7 129.6	6.282 5.135	5.709	0.3	- 0.54	- 4	- 0.099	5.070	
	3	1239	499.0	1804	39.95	21.0 16.4	17.761 20.219	18.990	1.0	- 1.80	- 4	- 0.099	17.091	1317
	4	1300	499.6	1808	39.95	47.2 52.3 56.6	10.089 10.160 9.621	10.223	0.4	- 0.72	- 8	- 0.198	9.305	
	5	1308	499.2	1808	39.95	85.1 109.8	7.151 5.868	6.510	0.8	- 1.44	- 8	- 0.198	4.872	
	6	1317	499.5	1808	41.20	19.6 19.6	18.431 18.431	18.431	0.5	- 0.90	- 8	- 0.198	17.333	1354
	7	1325	499.5	1794	41.20	30.3 32.3 25.7	14.413 13.868 15.870	14.717	0.5	- 0.90	+ 6	+ 0.149	13.966	
	8	1352	499.6	1794	41.95	39.8 41.8 42.7	12.174 11.795 11.633	11.867	0.4	- 0.72	+ 6	+ 0.149	11.296	1419
	9	1402	499.8	1794	41.95	71.2 78.0 60.4	8.167 7.635 9.192	8.331	0.2	- 0.36	+ 6	+ 0.149	8.120	
	10	1415	499.6	1794	42.70	33.6 34.0 34.6	13.538 13.440 13.296	13.425	0.4	- 0.72	+ 6	+ 0.149	12.854	1451
	11	1424	499.6	1794	42.70	44.0 49.1 50.2	11.407 10.605 10.447	10.820	0.4	- 0.72	+ 6	+ 0.149	10.249	
	12	1435	499.5	1794	42.70	88.4 92.1 104.6	6.947 6.732 6.097	6.592	0.5	- 0.90	+ 6	+ 0.149	5.841	
	13	1504	499.6	1794	43.95	25.7 24.4 24.0 25.0	15.870 16.346 16.499 16.122	16.209	0.4	- 0.72	+ 6	+ 0.149	15.638	
	14	1515	499.6	1794	43.95	34.1 32.5 32.5 32.8	13.416 13.816 13.816 13.739	13.697	-0.4	- 0.72	+ 6	+ 0.149	13.126	
	15	1527	499.5	1794	43.95	42.7 39.5 42.2 41.0	11.633 12.233 11.723 11.944	11.083	-0.5	- 0.90	+ 6	+ 0.149	11.132	
	16	1540	499.5	1794	43.95	55.1 52.3 56.3 55.1	9.802 10.160 9.656 9.802	9.855	0.5	- 0.90	+ 6	+ 0.149	9.104	
	17	1617	499.8	1794	44.75	27.5 26.1 26.3 26.0 25.7	15.262 15.730 15.662 15.765 15.870	15.658	-0.2	- 0.36	+ 6	+ 0.149	15.447	
	18	1629	500.2	1794	45.00	21.0 21.0 22.2 20.7	17.761 17.761 17.230 17.900	17.663	-0.2	+ 0.36	+ 6	+ 0.149	18.172	

TABLE I (cont'd)

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Date	Run No.	Mean Time	Avg. Temp. F	Avg. Press. psig	Average Rod Height 2's and 6's Inches	Reactor Period Sec.	Uncorrected Reactivity $\rho \times 10^{-4}$	Average Uncorrected Reactivity $\rho \times 10^{-4}$	Reactivity Corrections To 500 F and 1800 psig				Corrected Reactivity $\rho \times 10^{-4}$	Criticality Time
									ΔT	Temp.	ΔP	Press.		
									F	$\Delta p \times 10^{-4}$	psig	$\Delta p \times 10^{-4}$		
8/13/60	19	1638	500.3	1794	44.75	32.9 32.8 32.7	13.714 13.739 13.765	13.739	-0.3	+ 0.54	+ 6	+ 0.149	14.428	
	20	1647	500.4	1801	45.00	22.5 24.3 24.0 23.5	17.103 16.384 16.499 16.694	16.670	-0.4	+ 0.72	- 1	- 0.025	17.365	
	21	1705	500.6	1801	44.75	41.9 38.2 38.6 38.0 37.6	11.777 12.497 12.414 12.538 12.622	12.370	-0.6	+ 1.08	- 1	- 0.025	13.425	
	22	1717	500.4	1801	45.00	24.9 24.9 24.8 23.9	16.159 16.159 16.196 16.537	16.263	-0.4	+ 0.72	- 1	- 0.025	16.958	
	23	1727	499.8	1801	44.75	31.1 31.7 31.5 31.2	14.190 14.027 14.081 14.162	14.115	0.2	- 0.36	- 1	- 0.025	13.730	
	24	1736	500.0	1801	45.01	21.8 21.9 22.0	17.403 17.359 17.316	17.359	0	0	- 1	- 0.025	17.334	
	25	1747	499.9	1798	44.75	28.3 29.9 29.7 29.3	15.008 14.528 14.586 14.704	14.707	0.1	- 0.18	+ 2	+ 0.050	14.577	
	26	1756	500.3	1801	45.00	20.5 20.5 20.4	17.994 17.994 18.041	18.010	-0.3	+ 0.54	- 1	- 0.025	18.525	
	27	1814	499.4	1801	44.75	24.4 22.1 22.4 21.7 21.9	16.346 17.273 17.145 17.446 17.359	17.114	0.6	- 1.08	- 1	- 0.025	16.009	
	28	1827	499.7	1801	44.26	49.7 46.1 46.0 45.5 44.9	10.518 11.062 11.078 11.158 11.256	11.014	0.3	- 0.54	- 1	- 0.025	10.449	1708
	29	1840	499.8	1801	44.25	39.5 40.0 39.1 38.3	12.233 12.135 12.313 12.476	12.289	0.2	- 0.36	- 1	- 0.025	11.904	1708
	30	1915	501.2	1798	43.75	88.7 78.5 77.2 72.0	6.929 7.599 7.694 8.100	7.773	-1.2	+ 2.16	+ 2	+ 0.050	9.982	1840
	31	1927	500.7	1798	44.25	23.8 23.9 23.1 22.5	16.576 16.537 16.855 17.103	16.768	-0.7	+ 1.26	+ 2	+ 0.050	16.078	1708
	32	1938	500.6	1798	43.75	43.7 41.7 41.4 40.7	11.459 11.814 11.869 12.001	11.786	-0.6	+ 1.08	+ 2	0.050	12.916	1840

TABLE I (cont'd)

XENON TRANSIENT TESTS

Date	Run No.	Mean Time	Avg. Temp. F	Avg. Press. psig	Average Rod Height Inches	Reactor Period Sec.	Uncorrected Reactivity $\rho \times 10^{-4}$	Average Uncorrected Reactivity $\rho \times 10^{-4}$	Reactivity Corrections To 500 F and 1800 psig				Corrected Reactivity $\rho \times 10^{-4}$	Criticality Time
									ΔT F	Temp. $\Delta \rho \times 10^{-4}$	ΔP psig	Press. $\Delta \rho \times 10^{-4}$		
8/13/60	33	1957	500.4	1798	43.25	79.1 78.9 67.1 64.0 60.0	7.556 7.570 8.527 8.822 9.236	8.342	-0.4	+ 0.72	+ 2	+ 0.050	9.112	1914
	34	2011	500.3	1798	43.75	20.4 20.0 19.1 18.9	18.041 18.234 18.686 18.790	18.438	-0.3	+ 0.54	+ 2	+ 0.050	19.028	1840
	35	2020	500.0	1798	43.25	30.8 32.1 31.7 30.7	14.272 13.921 14.027 14.300	14.130	0	0	+ 2	+ 0.050	14.180	1914
	36	2036	499.0	1798	43.25	19.3 17.5 18.4 18.4	18.583 19.559 19.056 19.056	19.064	1.0	- 1.80	+ 2	+ 0.050	17.314	1914
	37	2047	499.6	1798	42.50	55.1 57.5 57.4 57.9	9.802 9.516 9.527 9.470	9.579	0.4	- 0.72	+ 2	+ 0.050	8.909	2011
	38	2059	501.4	1798	42.50	54.2 53.5 52.4 50.2	9.914 10.003 10.147 10.447	10.120	-1.4	+ 2.52	+ 2	+ 0.050	12.698	2011
	39	2116	500.7	1798	42.50	34.6 30.4 29.7 29.6 28.0	13.296 14.385 14.586 14.615 15.102	14.297	-0.7	+ 1.26	+ 2	+ 0.050	15.707	2010
	40	2132	500.2	1798	42.50	20.2 10.9 17.1 18.1 17.6	18.137 18.790 19.793 19.220 19.501	19.088	-0.2	+ 0.36	+ 2	+ 0.050	19.498	2010
	41	2141	500.3	1798	41.75	46.2 47.1 46.8	11.046 10.905 10.951	10.967	-0.3	+ 0.54	+ 2	+ 0.050	11.557	2057
	42	2154	500.4	1798	41.75	35.1 33.0 32.4 31.3	13.178 13.688 13.842 14.135	13.711	-0.4	+ 0.72	+ 2	+ 0.050	14.481	2057
	43	2057	500.4	1798	41.75	22.4 22.1 21.6	17.143 17.273 17.494	17.303	-0.4	+ 0.72	+ 2	+ 0.050	18.073	2057
	44	2216	500.3	1798	41.00	41.3 59.5 55.9 53.9	9.097 9.280 9.704 9.952	9.544	-0.3	+ 0.54	+ 2	+ 0.050	10.101	2138
	45	2228	500.2	1798	41.00	37.0 37.5 36.3 34.9	12.751 12.644 12.995 13.225	12.881	-0.2	+ 0.36	+ 2	+ 0.050	13.291	2138
	46	2241	500.2	1798	41.00	25.1 23.8 24.1 24.0	16.086 16.576 16.460 16.499	16.405	-0.2	+ 0.36	+ 2	+ 0.050	16.815	2138

TABLE I (cont'd)

XENON TRANSIENT TESTS

Date	Run No.	Mean Time	Avg. Temp. F	Avg. Press. psig	Average Rod Height 2's and 6's Inches	Reactor Period Sec.	Uncorrected Reactivity $\rho \times 10^{-4}$	Average Uncorrected Reactivity $\rho \times 10^{-4}$	Reactivity Corrections To 500 F and 1800 psig				Corrected Reactivity $\rho \times 10^{-4}$	Criticality Time
									ΔT F	Temp. $\Delta \rho \times 10^{-4}$	ΔP psig	Press. $\Delta \rho \times 10^{-4}$		
8/13/60	47	2251	500.8	1798	40.25	82.5	7.321	7.823	-0.8	+ 1.44	+ 2	+ 0.050	9.313	2223
						79.7	7.513							
						73.1	8.011							
						68.0	8.445							
	48	2304	500.8	1798	40.25	46.4	11.014	11.649	-0.8	+ 1.44	+ 2	+ 0.050	13.139	2223
						43.6	11.476							
						42.8	11.616							
						41.3	11.888							
	49	2320	500.8	1798	40.25	39.4	12.253	16.420	-0.8	+ 1.44	+ 2	+ 0.050	17.910	2223
						26.5	15.593							
						23.9	16.537							
						23.3	16.774							
	50	2331	500.9	1798	39.50	23.3	16.774	9.160	-0.9	+ 1.62	+ 2	+ 0.050	10.830	2258
						69.3	8.330							
						64.2	8.802							
						61.2	9.107							
	51	2343	500.8	1798	39.50	56.5	9.633	13.118	-0.8	+ 1.44	+ 2	+ 0.050	14.608	2258
						54.1	9.927							
						36.0	12.972							
						36.4	12.883							
	52	2355	500.8	1798	39.50	35.1	13.178	16.559	-0.8	+ 1.44	+ 2	+ 0.050	18.049	2298
						34.0	13.440							
						24.1	16.460							
						24.1	16.460							
8/14/60	53	0022	500.9	1794	38.50	24.1	16.460	11.051	-0.9	+ 1.62	+ 6	+ 0.149	12.820	2345
						23.1	16.855							
						52.0	10.200							
						46.0	11.078							
	54	0034	501.0	1794	38.50	44.8	11.273	14.735	-1.0	+ 1.80	+ 6	+ 0.149	16.684	2345
						42.6	11.651							
						31.1	14.190							
						29.0	14.794							
	55	0043	501.0	1794	38.50	28.8	14.854	17.960	-1.0	+ 1.80	+ 6	+ 0.149	19.909	2345
						28.0	15.102							
						21.2	17.670							
						21.4	17.580							
	56	0104	501.2	1794	37.50	20.8	17.853	9.902	-1.2	+ 2.76	+ 6	+ 0.149	12.211	0030
						19.0	18.737							
						62.2	9.003							
						54.2	9.914							
	57	0120	501.1	1794	37.53	52.1	10.187	15.530	-1.1	+ 1.98	+ 6	+ 0.149	17.659	0030
						49.8	10.504							
						29.5	14.645							
						26.6	15.559							
	58	0128	501.0	1794	37.50	25.5	15.941	18.842	-1.0	+ 1.80	+ 6	+ 0.149	20.791	0030
						25.4	15.977							
						18.8	18.842							
						18.8	18.842							
	59	0140	500.7	1794	36.75	18.8	18.842	12.262	-0.7	+ 1.26	+ 6	+ 0.149	13.671	0105
						44.2	11.373							
						39.2	12.293							
						38.2	12.497							
	*60	0151	500.4	1794	36.75	36.4	12.883	16.367	-0.4	+ 0.72	+ 6	+ 0.149	17.236	0105
						25.0	16.122							
						24.5	16.308							
						24.1	16.460							

Inverters not used to position control rods.

TABLE I (cont'd)

XENON TRANSIENT TESTS

Date	Run No.	Mean Time	Avg. Temp. F	Avg. Press. psig	Average Rod Height 2's and 6's Inches	Reactor Period Sec.	Uncorrected Reactivity $\rho \times 10^{-4}$	Average Uncorrected Reactivity $\rho \times 10^{-4}$	Reactivity Corrections To 500 F and 1800 psig				Corrected Reactivity $\rho \times 10^{-4}$	Criticality Time
									ΔT	Temp.	ΔP	Press.		
									F	$\Delta \rho \times 10^{-4}$	psig	$\Delta \rho \times 10^{-4}$		
8/14/60	61	0200	500.3	1794	36.75	16.4 17.0 16.8	20.219 19.852 19.973	20.015	-0.3	+ 0.54	+ 6	+ 0.149	20.704	0105
	62	0212	500.6	1794	36.00	43.8 39.2 38.2 36.6	11.441 12.293 12.497 12.838	12.267	-0.6	+ 1.08	+ 6	+ 0.149	13.496	0136
	63	0221	500.4	1794	36.00	26.1 25.4 24.5 24.2	15.730 15.977 16.308 16.422	16.109	-0.4	+ 0.72	+ 6	+ 0.149	16.978	0136
	64	0230	500.2	1794	36.00	17.2 18.6 17.0	19.734 18.948 19.852	19.511	-0.2	+ 0.36	+ 6	+ 0.149	20.020	0136
	65	0241	499.9	1794	35.00	71.2 61.8 57.6 53.6	8.167 9.044 9.527 9.990	9.182	0.1	- 0.18	+ 6	+ 0.149	9.151	0217
	66	0252	499.6	1794	35.00	35.4 34.3 34.1 32.6	13.109 13.368 13.416 13.791	13.421	0.4	- 0.72	+ 6	+ 0.149	12.850	0217
	67	0301	499.6	1794	35.00	23.1 23.6 23.9 23.6	16.855 16.655 16.537 16.655	16.676	0.4	- 0.72	+ 6	+ 0.149	16.105	0217
	68	0315	500.4	1794	34.25	68.4 60.8 59.2 54.3	8.409 9.150 9.323 9.901	9.196	-0.4	+ 0.72	+ 6	+ 0.149	10.065	0248
	69	0327	500.4	1794	34.25	35.8 32.6 32.5 31.9	13.017 13.791 13.816 13.974	13.650	-0.4	+ 0.72	+ 6	+ 0.149	14.519	0248
	70	0338	500.1	1794	34.25	23.0 21.1 21.1 20.6	16.896 17.715 17.715 17.946	17.568	-0.1	+ 0.18	+ 6	+ 0.149	17.897	0248
	71	0350	500.2	1794	33.50	50.8 46.0 44.4 42.4	10.363 11.078 11.340 11.687	11.117	-0.2	+ 0.36	+ 6	+ 0.149	11.626	0320
	72	0402	500.4	1794	33.50	30.0 27.3 27.4 25.9	14.499 15.327 15.294 15.800	15.230	-0.4	+ 0.72	+ 6	+ 0.149	16.099	0320
	73	0411	500.2	1794	33.50	19.3 18.3 18.4	18.583 19.110 19.056	18.916	-0.2	+ 0.36	+ 6	+ 0.149	19.425	0320
	74	0434	500.0	1794	32.50	41.8 38.4 36.8 35.2	11.795 12.455 12.795 13.155	12.550	0	0	+ 6	+ 0.149	12.699	0402
	75	0442	500.1	1794	32.50	22.2 25.8 26.1	17.230 15.835 15.730	16.265	-0.1	+ 0.18	+ 6	+ 0.149	16.594	0402

TABLE I (cont'd)

XENON TRANSIENT TESTS

Date	Run No.	Mean Time	Avg. Temp. F	Avg. Press. psig	Average Rod Height 2's and 6's Inches	Reactor Period Sec.	Uncorrected Reactivity $\rho \times 10^{-4}$	Average Uncorrected Reactivity $\rho \times 10^{-4}$	Reactivity Corrections To 500 F and 1860 psig				Corrected Reactivity $\rho \times 10^{-4}$	Criticality Time
									ΔT F	Temp. $\Delta \rho \times 10^{-4}$	ΔP psig	Press. $\Delta \rho \times 10^{-4}$		
8/14/66	76	0449	500.1	1794	32.50	20.6 19.8 19.6	17.946 18.332 18.431	18.236	-0.1	+ 0.18	+ 6	+ 0.149	18.565	0402
	77	0459	500.1	1794	31.75	60.0 52.7 50.7 48.6	9.236 10.107 10.377 10.678	10.100	-0.1	+ 0.18	+ 6	+ 0.149	10.429	0433
	78	0509	500.1	1794	31.75	34.6 32.2 31.7 30.6	13.296 13.895 14.027 14.328	13.887	-0.1	+ 0.18	+ 6	+ 0.149	14.216	0433
	79	0518	500.1	1794	31.75	22.4 22.2 21.6	17.145 17.230 17.491	17.289	-0.1	+ 0.18	+ 6	+ 0.149	17.618	0433
	80	0531	500.2	1794	31.00	58.6 53.0 49.6 47.2	9.390 10.068 10.533 10.889	10.220	-0.2	+ 0.36	+ 6	+ 0.149	10.729	0503
	81	0542	500.2	1794	31.00	32.8 29.8 29.3 28.4	13.739 14.557 14.704 14.977	14.494	-0.2	+ 0.36	+ 6	+ 0.149	15.003	0503
	82	0551	500.2	1794	31.00	20.8 20.2 20.0	17.853 18.137 18.234	18.075	-0.2	+ 0.36	+ 6	+ 0.149	18.584	0503
	83	0602	500.2	1794	30.25	60.0 54.0 50.8 47.8	9.236 9.939 10.363 10.798	10.084	-0.2	+ 0.36	+ 6	+ 0.149	10.593	0534
	84	0613	500.2	1794	30.25	33.8 31.3 30.9 30.3	13.489 14.135 14.245 14.413	14.071	-0.2	+ 0.36	+ 6	+ 0.149	14.580	0534
	85	0622	500.2	1794	30.25	21.8 21.5 21.2 21.2	17.403 17.535 17.670 17.670	17.570	-0.2	+ 0.36	+ 6	+ 0.149	18.079	0534
	86	0633	500.2	1794	29.50	64.0 55.8 53.2 50.3	8.822 9.717 10.042 10.433	9.754	-0.2	+ 0.36	+ 6	+ 0.149	10.263	0607
	87	0643	500.2	1794	29.50	34.5 33.5 33.1 31.8	13.320 13.563 13.663 14.000	13.637	-0.2	+ 0.36	+ 6	+ 0.149	14.146	0607
	88	0651	500.2	1794	29.50	23.3 23.7 23.0	16.774 16.615 16.896	16.762	-0.2	+ 0.36	+ 6	+ 0.149	17.271	0607
	89	0703	500.1	1794	28.75	73.8 62.8 59.0 55.6	7.955 8.942 9.345 9.741	8.996	-0.1	+ 0.18	+ 6	+ 0.149	9.325	0639
	90	0713	500.1	1794	28.75	38.9 35.4 33.7 34.1	12.353 13.189 13.040 13.416	12.980	-0.1	+ 0.18	+ 6	+ 0.149	13.389	0639
	91	0724	500.1	1794	28.75	23.7 23.8 22.8 22.2	16.615 16.576 16.978 17.230	16.850	-0.1	+ 0.18	+ 6	+ 0.149	17.179	0639

TABLE I (cont'd)

XENON TRANSIENT TESTS

Date	Run No.	Mean Time	Avg. Temp. F	Avg. Press. psig	Average Rod Height 2's and 6's Inches	Reactor Period Sec.	Uncorrected Reactivity $\rho \times 10^{-4}$	Average Uncorrected Reactivity $\rho \times 10^{-4}$	Reactivity Corrections To 500 F and 1800 psig				Corrected Reactivity $\rho \times 10^{-4}$	Criticality Time
									ΔT F	$\Delta p \times 10^{-4}$ psig	ΔP psig	$\Delta p \times 10^{-4}$		
8/14/66	92	0743	500.1	1794	27.75	78.0	7.635	8.091	-0.1	+ 0.18	+ 6	+ 0.149	8.420	0721
						72.2	8.084							
						66.8	8.554							
	93	0755	500.0	1794	27.75	41.3	11.888	12.463	0	0	+ 6	+ 0.149	12.612	0721
						38.7	12.394							
						37.5	12.644							
						36.2	12.927							
	94	0806	499.9	1794	27.75	25.6	15.906	16.478	0.1	- 0.18	+ 6	+ 0.149	16.447	0721
						23.7	16.615							
						23.9	16.537							
						23.1	16.855							
	95	0823	499.9	1794	27.00	50.1	10.461	10.944	0.1	- 0.18	+ 6	+ 0.149	10.913	0753
						48.7	10.663							
						45.4	11.174							
						43.6	11.476							
	96	0836	499.8	1794	27.00	29.2	14.734	15.515	0.2	- 0.36	+ 6	+ 0.149	15.304	0753
						27.1	15.393							
						26.7	15.526							
						25.9	15.800							
						25.0	16.123							
	97	0847	499.8	1794	27.00	18.2	19.165	19.666	0.2	- 0.36	+ 6	+ 0.149	19.455	0753
						17.1	19.793							
						17.0	19.852							
						17.0	19.852							
	98	0858	499.7	1794	26.25	50.0	10.476	11.187	0.3	- 0.54	+ 6	+ 0.149	10.796	0829
						45.9	11.094							
						49.4	11.340							
						41.7	11.814							
						39.6	12.213							
	99	0909	499.7	1794	26.25	26.7	15.526	15.686	0.3	- 0.54	+ 6	+ 0.149	15.295	0829
						26.3	15.662							
						25.7	15.870							
	100	0920	499.6	1794	26.25	17.1	19.793	19.678	0.4	- 0.72	+ 6	+ 0.149	19.107	0829
						18.0	19.275							
						17.1	19.793							
						17.0	19.852							
	101	0933	499.6	1794	25.25	87.2	7.020	7.772	0.4	- 0.72	+ 6	+ 0.149	7.201	0913
						86.6	7.057							
						70.7	8.209							
						64.2	8.802							
	102	0946	499.5	1794	25.25	44.5	11.323	12.388	0.5	- 0.90	+ 6	+ 0.149	11.637	0913
						42.0	11.759							
						36.9	12.773							
						36.4	12.883							
						35.0	13.201							
	103	1000	499.8	1794	25.25	24.7	16.233	16.782	0.2	- 0.36	+ 6	+ 0.149	16.571	0913
						23.0	16.896							
						23.0	16.896							
						22.5	17.103							
	104	1035	500.4	1794	24.50	37.9	12.559	14.899	-0.4	+ 0.72	+ 6	+ 0.149	15.768	0946
						25.6	15.906							
						24.7	16.233							
	105	1043	500.7	1794	24.50	21.1	17.715	18.154	-0.7	+ 1.26	+ 6	+ 0.149	19.563	0946
						20.1	18.185							
						20.0	18.234							
						19.5	18.481							
	106	1056	500.4	1794	23.75	56.2	9.668	10.635	-0.4	+ 0.72	+ 6	+ 0.149	11.504	1019
						49.4	10.561							
						47.0	10.920							
						44.1	11.390							

TABLE I (cont'd)

XENON TRANSIENT TESTS

Date	Run No.	Mean Time	Avg. Temp. °F	Avg. Press. psig	Average Rod Height 2's and 6's Inches	Reactor Period Sec.	Uncorrected Reactivity $\rho \times 10^{-4}$	Average Uncorrected Reactivity $\rho \times 10^{-4}$	Reactivity Corrections To 500 F. and 1880 psig				Corrected Reactivity $\rho \times 10^{-4}$	Criticality Time
									ΔT F	Temp. $\Delta \rho \times 10^{-4}$	ΔP psig	Press. $\Delta \rho \times 10^{-4}$		
8/14/60	107	1110	500.2	1794	23.75	29.1 26.5 26.0 25.1	14.764 15.593 15.765 16.086	15.552	-0.2	+ 0.36	+ 6	+ 0.149	16.061	1019
	108	1123	500.1	1794	23.75	16.1 15.6	20.408 20.734	20.571	-0.1	+ 0.18	+ 6	+ 0.149	20.909	1019
	109	1134	500.0	1794	23.00	44.0 39.4 38.0 37.0	11.407 12.253 12.538 12.751	12.237	0	0	+ 6	+ 0.149	12.386	1058
	110	1147	500.3	1794	23.00	29.2 26.8 26.0 24.5	14.734 15.492 15.765 16.308	15.575	-0.3	+ 0.54	+ 6	+ 0.149	16.264	1058
	111	1156	500.2	1794	23.00	17.7 16.5 16.3 16.3	19.494 20.156 20.281 20.281	20.053	-0.2	+ 0.36	+ 6	+ 0.149	20.562	1058
	112	1210	500.1	1794	22.25	46.0 40.9 39.8 37.7	11.078 11.407 12.174 12.601	11.815	-0.1	+ 0.18	+ 6	+ 0.149	12.144	1134
	113	1220	499.9	1794	22.25	26.3 26.7 26.3 25.3	15.662 15.526 15.662 16.013	15.716	0.1	- 0.18	+ 6	+ 0.149	15.685	1134
	114	1231	499.6	1794	22.25	17.0 17.3 16.2	19.852 19.675 20.345	19.957	0.4	- 0.72	+ 6	+ 0.149	19.386	1134
	115	1244	499.7	1794	21.25	77.7 72.5 67.2 61.8	7.657 8.059 8.518 9.044	8.320	0.3	- 0.54	+ 6	+ 0.149	7.929	1220
	116	1257	499.8	1794	21.25	42.2 40.6 39.4 38.5	11.723 12.020 12.253 12.435	12.108	0.2	- 0.36	+ 6	+ 0.149	11.897	1220
	117	1308	499.7	1794	21.25	26.9 27.1 26.4	15.459 15.393 15.627	15.493	0.3	- 0.54	+ 6	+ 0.149	15.102	1220
	118	1318	499.8	1794	21.25	19.3 19.2	18.583 18.634	18.609	0.2	- 0.36	+ 6	+ 0.149	18.398	1220
	119	1333	499.8	1794	20.25	77.8 77.0 71.0 66.2	7.650 7.709 8.184 8.610	8.038	0.2	- 0.36	+ 6	+ 0.149	7.827	1307
	120	1343	499.7	1794	20.25	45.5 47.0 45.3 43.6	11.158 10.920 11.191 11.476	11.186	0.3	- 0.54	+ 6	+ 0.149	10.795	1307
	121	1355	499.8	1794	20.25	30.9 31.3 30.4 29.9	14.245 14.135 14.385 14.528	14.323	0.2	- 0.36	+ 6	- 0.149	14.112	1307
	122	1406	499.8	1794	20.25	20.6 20.9 20.1 20.6	17.946 17.807 18.185 17.946	17.971	0.2	- 0.36	+ 6	+ 0.149	17.760	1307

TABLE I (cont'd)

XENON TRANSIENT TESTS

Date	Run No.	Mean Time	Avg. Temp. F	Avg. Press. psig	Average Rod Height 3'a and 6'a Inches	Reactor Period Sec.	Uncorrected Reactivity $\rho \times 10^{-6}$	Average Uncorrected Reactivity $\rho \times 10^{-6}$	Reactivity Corrections To 500 F and 1800 psig				Corrected Reactivity $\rho \times 10^{-6}$	Criticality Time
									ΔT F	$\Delta p \times 10^{-4}$	ΔP psig	$\Delta p \times 10^{-4}$		
9/14/60	123	1419	499.9	1794	19.25	99.4 93.7 89.0 82.1	6.346 6.643 6.911 7.348	6.812	0.1	- 0.18	+ 6	+ 0.149	6.781	1357
	124	1432	500.2	1794	19.25	55.4 54.4 51.1 49.2	9.765 9.889 10.322 10.590	10.142	-0.2	+ 0.36	+ 6	+ 0.149	10.651	1357
	125	1444	499.9	1794	19.25	29.7 31.5 31.1 30.6	14.586 14.081 14.190 14.328	14.296	0.1	- 0.18	+ 6	+ 0.149	14.265	1357
	126	1454	499.8	1794	19.25	23.3 22.3 21.7	16.774 17.187 17.446	17.136	0.2	- 0.36	+ 6	+ 0.149	16.925	1357
	127	1509	500.4	1794	18.25	115.8 99.8 91.1 84.7	5.624 6.326 6.789 7.177	6.479	-0.4	+ 0.72	+ 6	+ 0.149	7.348	1440
	128	1526	500.1	1794	18.25	50.0 43.8 39.5 38.3	10.476 11.441 12.233 12.374	11.631	-0.1	+ 0.18	+ 6	+ 0.149	11.960	1440
	130	1552	499.8	1804	18.25	18.4 17.8	19.056 19.388	19.222	0.2	- 0.36	- 4	- 0.099	18.763	1440
	131	1605	500.5	1804	17.25	71.0 68.5 63.8 59.3	8.184 8.400 8.841 9.312	8.684	-0.5	+ 0.90	- 4	- 0.099	9.485	1527
	132	1617	500.3	1804	17.25	40.2 40.6 38.8 37.6	12.096 12.020 12.374 12.622	12.278	-0.3	+ 0.54	- 4	- 0.099	12.719	1527
	133	1629	500.0	1804	17.25	26.2 27.1 26.2 25.5	15.696 15.393 15.696 15.941	15.682	0	0	- 4	- 0.099	15.583	1527
	134	1641	500.6	1804	17.25	22.3 21.4 21.6	17.187 17.580 17.491	17.419	-0.6	+ 1.08	- 4	- 0.099	18.400	1527
	135	1654	500.6	1804	16.25	69.8 64.2 61.7 57.8	8.286 8.802 9.055 9.481	8.906	-0.6	+ 1.08	- 4	- 0.099	9.887	1615
	136	1706	500.4	1804	16.25	40.0 40.4 39.1 37.5	12.135 12.058 12.313 12.644	12.288	-0.4	+ 0.72	- 4	- 0.099	12.909	1615
	137	1718	500.2	1804	16.25	26.6 25.7 25.7 18.3	15.559 15.870 15.870 19.110	16.602	-0.2	+ 0.36	- 4	- 0.099	16.863	1615
	138	1733	500.1	1804	16.25	18.2 17.6 17.6	19.165 19.501 19.501	19.389	-0.1	+ 0.18	- 4	- 0.099	19.470	1615
	139	1746	500.4	1804	15.25	47.8 47.6 47.0 45.0	10.798 10.828 10.920 11.240	10.947	-0.4	+ 0.72	- 4	- 0.099	11.568	1659

TABLE I (cont'd)

XENON TRANSIENT TESTS

Date	Run No.	Run Time	Avg. Temp. °F	Avg. Press. psig	Average Rod Height 2's and 6's Inches	Reactor Period Sec.	Uncorrected Reactivity $\rho \times 10^{-4}$	Average Uncorrected Reactivity $\rho \times 10^{-4}$	Reactivity Corrections To 500 F and 1800 psig				Corrected Reactivity $\rho \times 10^{-4}$	Criticality Time
									ΔT	Temp.	ΔP	Press.		
									F	$\Delta p \times 10^{-4}$	psig	$\Delta p \times 10^{-4}$		
6/24/60	140	1759	500.6	1804	15.25	34.7 34.7 33.5 32.5	13.272 13.272 13.563 13.816	13.481	-0.6	+ 1.08	- 4	- 0.099	14.462	1659
	141	1811	500.6	1804	15.25	23.7 23.7 23.4 22.6	16.615 16.615 16.734 17.061	16.756	-0.6	+ 1.08	- 4	- 0.099	17.737	1659
	142	1825	500.5	1804	14.25	53.6 52.3 49.6 47.4	9.990 10.160 10.533 10.859	10.386	-0.5	+ 0.90	- 4	- 0.099	11.187	1734
	143	1845	501.2	1804	14.25	40.1 35.5 34.4 33.2 32.2	12.116 13.086 13.344 13.638 13.895	13.216	-1.2	+ 2.16	- 4	- 0.99	15.277	1734
	144	1859	500.8	1804	14.25	23.6 22.6 22.5 16.4	16.655 17.061 17.103 20.219	17.760	-0.8	+ 1.44	- 4	- 0.099	19.101	1734
	145	1917	500.9	1804	13.00	54.4 52.1 50.0 48.6	9.889 10.187 10.476 10.678	10.308	-0.9	+ 1.62	- 4	- 0.099	11.829	1819
	146	1932	499.9	1804	13.00	28.9 28.4 27.6	14.824 14.977 15.230	15.010	0.1	- 0.18	- 4	- 0.099	14.731	1819
	147	2001	501.0	1804	11.75	50.4 49.9 49.9	10.419 10.490 10.490	10.466	-1.0	+ 1.8	- 4	- 0.099	12.167	1901
	148	2017	500.9	1804	11.75	34.0 33.2 31.7	13.440 13.638 14.027	13.702	-0.9	+ 1.62	- 4	- 0.099	15.223	1901
	149	2035	499.8	1804	11.75	19.2 18.1 18.6	18.634 19.220 18.948	18.934	0.2	- 0.36	- 4	- 0.099	18.475	1901

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

XENON TRANSIENT TESTS
DLCS 1560109
T-612081

TABLE II

DATA PRIOR TO SHUTDOWN

Time of start of shutdown 0824 - August 13, 1960			Time
Gross Gen. Load MW	64.8		0630
Net Gen. Load MW	56.1		0630
EPPH	1565.4		0824
Te 1A (F)	488.0		0800
1B (F)	488.5		0800
1C (F)	488.5		0800
1D (F)	487.0		0800
TE 1A (F)	508.5		0800
1B (F)	510.5		0800
1C (F)	511.5		0800
1D (F)	510.5		0800
1A Loop Pressure - psig	1825		0800
1B	1850		0800
1C	1825		0800
1D	1860		0800
1A Loop Flow x 10 ⁶ lbs/hr	----		0800
1B	7.25		0800
1C	7.25		0800
1D	----		0800

Rod Positions at 0630 on August 13, 1960

Rod	Rod Sub-group Numbers							
	1's	2's	3's	4's	5's	6's	7's	8's
1	69.00	19.29	69.00	0.0	69.00	19.19	69.00	0.0
2	69.00	19.22	69.00	0.0	69.00	19.23	69.00	0.0
3	69.00	19.28	69.00	0.0	69.00	19.18	69.00	0.0
4	69.00	19.26	69.00	0.0	69.00	19.15	69.00	0.0

NOTE: All values are as indicated and are uncorrected.

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

XENON TRANSIENT TESTS
DLCS 1560109
T-612081

TABLE II (cont'd)

POWER LEVEL FOR 40 HOURS PRIOR TO SHUTDOWN

Date	Time	Average Per Cent Power		Time	Average Per Cent Power
8/11/60	1530	103.9	8/13/60	0230	102.3
	1630	103.6		0330	101.6
	1730	104.0		0430	102.3
	1830	104.4		0530	102.1
	1930	104.5		0630	101.3
	2030	104.5			
	2130	104.1			
	2230	104.25			
	2330	103.25			
	0030	103.5			
8/12/60	0130	103.2			
	0230	103.4			
	0330	103.4			
	0430	103.8			
	0530	102.1			
	0630	103.5			
	0730	103.3			
	0830	102.75			
	0930	102.75			
	1030	102.75			
	1130	103.0			
	1230	103.3			
	1330	103.3			
	1430	103.3			
	1530	103.75			
	1630	104.4			
	1730	103.25			
	1830	102.4			
	1930	102.6			
	2030	100.25			
	2130	104.0			
	2230	102.75			
	2330	102.2			
8/13/60	0030	101.9			
	0130	101.7			

Average Power level for 40 hours prior to shutdown 102.65 per cent.

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

XENON TRANSIENT TESTS
DLCS 1560109
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TABLE II (cont'd)

ROD HEIGHTS 6 HOURS PRIOR TO SHUTDOWN

DATE: August 13, 1960						
Time	0230	0330	0430	0530	0630	0730
Rod No.						
11	69.00	69.00	69.00	69.00	69.00	69.00
12	69.01	69.01	69.01	69.01	69.01	69.01
13	68.95	68.95	68.95	68.95	68.95	68.95
14	69.05	69.05	69.05	69.05	69.05	69.05
21	19.32	19.29	19.29	19.29	19.29	19.26
22	19.22	19.22	19.22	19.22	19.22	19.20
23	19.28	19.28	19.28	19.28	19.28	19.25
24	19.26	19.26	19.26	19.26	19.26	19.24
31	68.96	68.96	68.96	68.96	68.96	68.96
32	69.04	69.04	69.04	69.04	69.04	69.04
33	69.00	69.00	69.00	69.00	69.00	69.00
34	68.98	68.98	68.98	68.98	68.98	68.98
41	.94	.94	.94	.94	.94	.94
42	1.00	1.00	1.00	1.00	1.00	1.00
43	.99	.99	.99	.99	.99	.99
44	1.00	1.00	1.00	1.00	1.00	1.00
51	68.99	68.99	68.99	68.99	68.99	68.99
52	68.98	68.98	68.98	68.98	68.98	68.98
53	69.05	69.05	69.05	69.05	69.05	69.05
54	68.98	68.98	68.98	68.98	68.98	68.98
61	19.19	19.19	19.19	19.19	19.19	19.30
62	19.23	19.23	19.23	19.23	19.23	19.31
63	19.18	19.18	19.18	19.18	19.18	19.26
64	19.15	19.15	19.15	19.15	19.15	19.23
71	68.95	68.95	68.95	68.95	68.95	68.95
72	68.90	68.90	68.90	68.90	68.90	68.90
73	68.93	68.93	68.93	68.93	68.93	68.93
74	69.03	69.03	69.03	69.03	69.03	69.03
81	1.00	1.00	1.00	1.00	1.00	1.00
82	1.05	1.05	1.05	1.05	1.05	1.05
83	.96	.96	.96	.96	.96	.96
84	.95	.95	.95	.95	.95	.95

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

XENON TRANSIENT TESTS
DLCS 1560109
T-612081

TABLE III

REACTOR COOLANT LOOP TEMPERATURE

			Temperatures - Mueller Bridges										
Date	Run No.	Time	1A Tc		1C Tc		1D Tc		Avg.	Temp. Th (Norwood)			
			ohms	Corr. F	ohms	Corr. F	ohms	Corr. F	Tc F	1A F	1B F	1C F	1D F
8/13/60	1	1225	49.907	499.4	49.920	499.7	49.827	499.4	499.5	497.7	474.5	501.5	500.0
	2	1232	49.915	499.6	49.925	499.8	49.835	499.6	499.7	497.7	474.5	501.7	500.0
	3	1248	49.880	498.9	49.895	499.2	49.800	498.9	499.0	497.4	470.5	501.0	499.3
	4	1258	49.905	499.4	49.930	499.9	49.827	499.4	499.6	497.6	469.0	501.3	499.9
	5	1306	49.885	499.0	49.915	499.6	49.805	499.0	499.2	497.4	467.8	501.0	499.5
	6	1317	49.900	499.3	49.930	499.9	49.820	499.3	499.5	497.4	466.3	501.3	499.5
	7	1325	49.895	499.2	49.930	499.9	49.820	499.3	499.5	497.4	465.0	501.1	499.5
	8	1351	49.910	499.5	49.925	499.8	49.830	499.5	499.6	498.0	461.4	501.3	500.0
	9	1400	49.920	499.7	49.930	499.9	49.840	499.7	499.8	498.0	458.0	501.3	500.0
	10	1415	49.905	499.4	49.930	499.9	49.830	499.5	499.6	498.0	457.0	501.4	499.9
	11	1423	49.910	499.5	49.930	499.9	49.830	499.5	499.6	497.7	455.0	501.1	499.6
	12	1435	49.900	499.3	49.930	499.9	49.820	499.3	499.5	497.5	457.0	501.3	499.8
	13	1504	49.910	499.5	49.920	499.7	49.830	499.5	499.6	497.5	457.0	501.2	499.7
	14	1515	49.910	499.5	49.920	499.7	49.835	499.6	499.6	497.7	-----	501.3	500.0
	15	1526	49.910	499.5	49.915	499.6	49.830	499.5	499.5	497.7	-----	501.2	499.7
	16	1538	49.900	499.3	49.920	499.7	49.825	499.4	499.5	497.7	-----	501.1	499.7
	17	1617	49.920	499.7	49.940	500.1	49.840	499.7	499.8	-----	-----	-----	-----
	18	1629	49.940	500.1	49.960	500.5	49.860	500.0	500.2	-----	-----	-----	-----
	19	1638	49.950	500.3	49.960	500.5	49.870	500.2	500.3	-----	-----	-----	-----
	20	1647	49.960	500.5	49.950	500.3	49.880	500.4	500.4	-----	-----	-----	-----
	21	1705	49.960	500.5	49.970	500.7	49.890	500.6	500.6	-----	-----	-----	-----
	22	1717	49.950	500.3	49.960	500.5	49.880	500.4	500.4	-----	-----	-----	-----
	23	1727	49.910	499.5	49.940	500.1	49.840	499.7	499.8	-----	-----	-----	-----
	24	1736	49.930	499.9	49.950	500.3	49.850	499.9	500.0	-----	-----	-----	-----
	25	1747	49.920	499.7	49.940	500.1	49.850	499.9	499.9	498.0	-----	502.0	500.0
	26	1756	49.940	500.1	49.970	500.7	49.860	500.0	500.3	498.2	-----	502.3	500.4
	27	1815	49.900	499.3	49.920	499.7	49.810	499.1	499.4	497.5	-----	501.2	499.4
	28	1825	49.910	499.5	49.940	500.1	49.825	499.4	499.7	497.5	-----	501.3	499.8
	29	1839	49.920	499.7	49.940	500.1	49.830	499.5	499.8	497.7	-----	501.7	499.9
	30	1913	49.990	501.1	50.000	501.3	49.915	501.5	501.2	499.0	-----	503.0	501.2
	31	1927	49.970	500.7	49.970	500.7	49.900	500.8	500.7	499.0	-----	502.7	501.1
	32	1938	49.965	500.6	49.965	500.6	49.895	500.7	500.6	499.0	-----	502.7	501.0
	33	1957	49.950	500.3	49.960	500.5	49.880	500.4	500.4	498.7	-----	502.7	500.8
	34	2011	49.930	499.9	49.975	500.8	49.870	500.2	500.3	498.3	-----	502.3	500.6

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

XENON TRANSIENT TESTS
DLCS 1560109
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TABLE III (cont'd)

REACTOR COOLANT LOOP TEMPERATURE

			Temperatures - Mueller Bridges							Temp. Th (Norwood)			
Date	Run No.	Time	1A Tc		1C Tc		1D Tc		Avg.				
			ohms	Corr. F	ohms	Corr. F	ohms	Corr. F	Tc F	1A F	1B F	1C F	1D F
8/13/60	35	2021	49.930	499.9	49.960	500.5	49.830	499.5	500.0	498.0	-----	502.0	500.0
	36	2037	49.880	498.9	49.910	499.5	49.780	498.5	499.0	497.1	-----	501.1	499.0
	37	2048	49.900	499.3	49.935	500.0	49.825	499.4	499.6	497.1	-----	501.3	499.4
	38	2058	49.985	501.0	50.050	502.2	49.910	501.0	501.4	498.9	-----	503.1	501.1
	39	2115	49.960	500.5	49.985	501.0	49.890	500.6	500.7	498.9	469.0	502.8	500.9
	40	2132	49.940	500.1	49.950	500.3	49.870	500.2	500.2	498.3	472.0	502.2	500.4
	41	2141	49.940	500.1	49.960	500.5	49.870	500.2	500.3	498.2	474.0	502.3	500.4
	42	2154	49.950	500.3	49.960	500.5	49.875	500.3	500.4	498.2	476.0	502.5	500.8
	43	2206	49.945	500.2	49.970	500.7	49.870	500.2	500.4	498.2	477.8	502.3	500.8
	44	2216	49.940	500.1	49.970	500.7	49.870	500.2	500.3	498.3	478.8	502.4	500.6
	45	2228	49.940	500.1	49.955	500.4	49.870	500.2	500.2	498.3	480.0	502.3	500.6
	46	2242	49.940	500.1	49.950	500.3	49.870	500.2	500.2	498.2	481.5	502.0	500.4
	47	2251	49.970	500.7	49.980	500.9	49.990	500.8	500.8	498.6	482.2	502.5	501.0
	48	2305	49.975	500.8	49.980	500.9	49.990	500.8	500.8	498.8	483.6	502.7	501.1
	49	2320	49.970	500.7	49.990	501.1	49.895	500.7	500.8	498.8	484.6	502.7	501.1
	50	2331	49.970	500.7	49.995	501.2	49.900	500.8	500.9	498.8	485.0	502.7	501.0
	51	2344	49.960	500.5	49.990	501.1	49.900	500.8	500.8	498.8	486.0	502.7	501.0
	52	2354	49.970	500.7	49.975	500.8	49.900	500.8	500.8	498.7	486.4	502.6	501.0
8/14/60	53	0020	49.970	500.7	50.000	501.3	49.900	500.8	500.9	498.8	487.3	502.8	501.2
	54	0033	49.980	500.9	50.000	501.3	49.900	500.8	501.0	498.8	488.0	502.8	501.2
	55	0042	49.980	500.9	50.000	501.3	49.900	500.8	501.0	498.8	488.0	502.8	501.1
	56	0102	49.990	501.1	50.000	501.3	49.920	501.2	501.2	499.1	489.9	503.2	501.6
	57	0120	49.985	501.0	49.990	501.1	49.920	501.2	501.1	499.1	489.0	503.1	501.3
	58	0128	49.980	500.9	49.990	501.1	49.910	501.0	501.0	499.1	489.3	503.1	501.2
	59	0139	49.965	500.6	49.980	500.9	49.895	500.7	500.7	498.8	489.5	502.8	501.0
	60	0150	49.950	500.3	49.960	500.5	49.880	500.4	500.4	498.3	489.5	502.5	500.6
	61	0200	49.940	500.1	49.960	500.5	49.875	500.3	500.3	498.2	489.6	502.4	500.5
	62	0211	49.960	500.5	49.970	500.7	49.890	500.6	500.6	498.5	489.9	502.5	501.0
	63	0220	49.950	500.3	49.960	500.5	49.880	500.4	500.4	498.5	490.0	502.5	500.8
	64	0230	49.940	500.1	49.950	500.3	49.870	500.2	500.2	498.2	490.0	502.1	500.5
	65	0239	49.925	499.8	49.935	500.0	49.855	500.0	499.9	498.0	490.0	502.0	500.1
	66	0251	49.910	499.5	49.920	499.7	49.840	499.7	499.6	497.8	490.0	501.8	500.0
	67	0300	49.905	499.4	49.920	499.7	49.840	499.7	499.6	497.7	490.0	501.6	500.9
	68	0313	49.950	500.3	49.960	500.5	49.880	500.4	500.4	498.2	490.2	501.3	499.7
	69	0326	49.950	500.3	49.960	500.5	49.880	500.4	500.4	498.5	490.2	502.7	500.8

TABLE III (cont'd)

REACTOR COOLANT LOOP TEMPERATURE

			Temperatures - Mueller Bridges							Temp. Th (Norwood)			
			1A Tc		1C Tc		1D Tc		Avg.				
	No.	Time	ohms	Corr. F	ohms	Corr. F	ohms	Corr. F	Tc F	1A F	1B F	1C F	1D F
8/14/60	70	0337	49.935	500.0	49.945	500.2	49.865	500.1	500.1	498.3	490.2	502.2	500.4
	71	0349	49.940	500.1	49.955	500.4	49.870	500.2	500.2	498.1	490.2	502.2	500.5
	72	0401	49.950	500.3	49.965	500.6	49.880	500.4	500.4	498.3	490.5	502.6	500.7
	73	0410	49.940	500.1	49.950	500.3	49.870	500.2	500.2	498.4	490.5	502.3	500.5
	74	0433	49.925	499.8	49.940	500.1	49.860	500.0	500.0	498.0	490.5	502.0	500.2
	75	0442	49.930	499.9	49.940	500.1	49.870	500.2	500.1	498.0	490.5	502.0	500.2
	76	0449	49.930	499.9	49.940	500.1	49.870	500.2	500.1	498.0	490.5	502.1	500.2
	77	0457	49.930	499.9	49.945	500.2	49.870	500.2	500.1	498.0	490.5	502.1	500.4
	78	0509	49.930	499.9	49.950	500.3	49.870	500.2	500.1	498.0	490.5	502.1	500.3
	79	0518	49.930	499.9	49.950	500.3	49.870	500.2	500.1	498.0	490.5	502.2	500.3
	80	0529	49.935	500.0	49.950	500.3	49.870	500.2	500.2	498.0	490.5	502.2	500.3
	81	0541	49.935	500.0	49.950	500.3	49.870	500.2	500.2	498.0	490.5	502.2	500.2
	82	0551	49.935	500.0	49.950	500.3	49.870	500.2	500.2	498.0	490.5	502.2	500.2
	83	0600	49.935	500.0	49.950	500.3	49.870	500.2	500.2	498.0	490.5	502.3	500.3
	84	0612	49.935	500.0	49.950	500.3	49.870	500.2	500.2	498.0	490.5	502.3	500.3
	85	0621	49.935	500.0	49.950	500.3	49.870	500.2	500.2	498.0	490.5	502.3	500.3
	86	0631	49.935	500.0	49.950	500.3	49.870	500.2	500.2	498.0	490.5	502.2	500.3
	87	0642	49.935	500.0	49.950	500.3	49.870	500.2	500.2	498.0	490.5	502.2	500.3
	88	0651	49.935	500.0	49.950	500.3	49.870	500.2	500.2	498.0	490.5	502.3	500.3
	89	0701	49.930	499.9	49.945	500.2	49.870	500.2	500.1	498.0	490.5	502.3	500.3
	90	0712	49.930	499.9	49.950	500.3	49.870	500.2	500.1	498.0	490.7	502.3	500.3
	91	0723	49.930	499.9	49.950	500.3	49.870	500.2	500.1	498.0	490.7	502.3	500.3
	92	0740	49.930	499.9	49.945	500.2	49.870	500.2	500.1	498.0	490.7	502.2	500.3
	93	0754	49.925	499.8	49.945	500.2	49.860	500.0	500.0	498.0	490.7	502.2	500.3
	94	0807	49.920	499.7	49.940	500.1	49.860	500.0	499.9	498.0	490.7	502.2	500.3
	95	0824	49.920	499.7	49.935	500.0	49.860	500.0	499.9	497.9	490.6	502.0	500.2
	96	0836	49.915	499.6	49.930	499.9	49.855	499.9	499.8	497.9	490.5	502.0	500.2
	97	0847	49.910	499.5	49.930	499.9	49.850	499.9	499.8	497.9	490.5	502.0	500.2
	98	0858	49.910	499.5	49.925	499.8	49.850	499.9	499.7	497.9	490.5	501.8	500.1
	99	0910	49.910	499.5	49.920	499.7	49.850	499.9	499.7	497.9	490.4	501.9	500.1
	100	0920	49.905	499.4	49.920	499.7	49.845	499.8	499.6	497.9	490.4	501.8	500.0
	101	0934	49.905	499.4	49.920	499.7	49.840	499.7	499.6	497.6	490.4	501.8	499.9
	102	0946	49.900	499.3	49.915	499.6	49.840	499.7	499.5	497.8	490.4	501.7	499.9
	103	1000	49.915	499.6	49.930	499.9	49.855	499.9	499.8	497.8	490.4	501.8	500.0

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

XENON TRANSIENT TESTS
DLCS 1560109
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TABLE III (cont'd)

REACTOR COOLANT LOOP TEMPERATURE

			Temperatures - Mueller Bridges							Temp. Th (Norwood)			
			1A Tc		1C Tc		1D Tc		Avg.				
	No.	Time	ohms	Corr. F	ohms	Corr. F	ohms	Corr. F	Tc F	1A F	1B F	1C F	1D F
8/14/60	104	1035	49.945	500.2	49.960	500.5	49.880	500.4	500.4	498.9	490.8	502.5	500.7
	105	1042	49.960	500.5	49.975	500.8	49.900	500.8	500.7	498.7	490.8	502.8	501.0
	106	1056	49.950	500.3	49.955	500.4	49.890	500.6	500.4	498.8	491.0	502.7	501.0
	107	1110	49.940	500.1	49.950	500.3	49.870	500.2	500.2	498.5	490.8	502.5	500.5
	108	1123	49.930	499.9	49.945	500.2	49.875	500.3	500.1	498.5	490.8	502.3	500.5
	109	1133	49.920	499.7	49.935	500.0	49.870	500.2	500.0	498.2	490.8	502.2	500.3
	110	1146	49.940	500.1	49.955	500.4	49.880	500.4	500.3	498.3	490.7	502.4	500.4
	111	1157	49.935	500.0	49.950	500.3	49.880	500.4	500.2	498.5	491.0	502.5	500.6
	112	1210	49.930	499.9	49.940	500.1	49.870	500.2	500.1	498.5	491.0	502.2	500.3
	113	1221	49.920	499.7	49.940	500.1	49.860	500.0	499.9	498.0	491.0	502.0	500.2
	114	1231	49.905	499.4	49.920	499.7	49.845	499.8	499.6	497.9	490.7	501.7	499.9
	115	1244	49.905	499.4	49.925	499.8	49.845	499.8	499.7	497.9	490.7	501.8	499.9
	116	1256	49.910	499.5	49.930	499.9	49.850	499.9	499.8	497.7	490.5	501.6	499.9
	117	1307	49.905	499.4	49.930	499.9	49.850	499.9	499.7	497.7	490.6	501.7	500.0
	118	1319	49.910	499.5	49.930	499.9	49.850	499.9	499.8	497.8	490.7	501.8	500.0
	119	1331	49.910	499.5	49.930	499.9	49.850	499.9	499.8	497.8	490.6	501.9	500.1
	120	1344	49.905	499.4	49.925	499.8	49.845	499.8	499.7	497.8	490.6	501.7	500.0
	121	1354	49.910	499.5	49.930	499.9	49.850	499.9	499.8	497.9	490.6	501.7	500.0
	122	1407	49.910	499.5	49.930	499.9	49.850	499.9	499.8	497.9	490.6	501.8	500.1
	123	1420	49.920	499.7	49.940	500.1	49.860	500.0	499.9	497.9	490.6	501.8	500.1
	124	1432	49.935	500.0	49.950	500.3	49.875	500.3	500.2	498.2	490.7	502.2	500.6
	125	1444	49.920	499.7	49.940	500.1	49.860	500.0	499.9	498.2	490.7	502.0	500.2
	126	1455	49.915	499.6	49.925	499.8	49.855	499.9	499.8	498.2	490.7	501.9	500.2
	127	1510	49.945	500.2	49.965	500.6	49.885	500.5	500.4	498.5	483.2	502.4	500.6
	128	1526	49.925	499.8	49.945	500.2	49.875	500.3	500.1	498.2	480.1	502.1	500.4
	129	1539	49.907	499.4	49.928	499.9	49.842	499.7	499.7	498.1	482.2	501.8	500.0
	130	1552	49.913	499.6	49.935	500.0	49.851	499.9	499.8	498.0	484.0	502.0	500.0
	131	1605	49.951	500.3	49.970	500.7	49.892	500.6	500.5	498.6	485.0	502.6	500.8
	132	1615	49.935	500.0	49.960	500.5	49.880	500.4	500.3	498.6	485.8	502.3	501.6
	133	1629	49.930	499.9	49.925	499.8	49.870	500.2	500.0	498.6	486.5	502.0	500.3
	134	1641	49.955	500.4	49.965	500.6	49.900	500.8	500.6	498.6	487.0	502.2	500.7
	135	1654	49.960	500.5	49.965	500.6	49.900	500.8	500.6	499.0	487.8	502.7	501.0
	136	1706	49.950	500.3	49.950	500.3	49.890	500.6	500.4	499.0	488.0	502.5	500.7
	137	1718	49.940	500.1	49.965	500.6	49.860	500.0	500.2	498.6	488.3	502.2	500.2

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
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DLCS 1560109
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TABLE III (cont'd)

REACTOR COOLANT LOOP TEMPERATURE

			Temperatures - Mueller Bridges							Temp. Th (Norwood)			
			1A Tc		1C Tc		1D Tc		Avg.				
Date	Run No.	Time		Corr. F		Corr. F		Corr. F	Tc F	1A F	1B F	1C F	1D F
8/14/60	138	1733	49.930	499.9	49.950	500.3	49.870	500.2	500.1	498.6	488.7	502.2	500.2
	139	1746	49.945	500.2	49.965	500.6	49.885	500.5	500.4	498.5	489.0	502.2	500.6
	140	1759	49.960	500.5	49.965	500.6	49.900	500.8	500.6	498.9	489.4	502.6	501.0
	141	1810	49.950	500.3	49.965	500.6	49.900	500.8	500.6	499.0	489.7	502.7	501.0
	142	1825	49.950	500.3	49.970	500.7	49.880	500.4	500.5	499.0	490.0	502.5	500.6
	143	1845	49.985	501.0	50.010	501.5	49.920	501.2	501.2	499.3	490.0	503.1	501.2
	144	1859	49.970	500.7	49.970	500.7	49.910	501.0	500.8	499.2	490.1	503.0	501.2
	145	1917	49.970	500.7	49.990	501.1	49.910	501.0	500.9	499.2	490.2	503.0	501.2
	146	1932	49.920	499.7	49.930	499.9	49.860	500.0	499.9	498.2	490.5	502.0	500.1
	147	2001	49.970	500.7	49.995	501.2	49.910	501.0	501.0	498.8	490.7	502.5	501.0
	148	2017	49.970	500.7	49.990	501.1	49.910	501.0	500.9	499.0	490.8	502.8	501.0
	149	2035	49.920	499.7	49.920	499.7	49.860	500.0	499.8	498.0	490.8	501.7	500.0
	150	2123	50.020	501.7	50.040	502.1	49.980	502.4	502.1	500.1	491.3	504.1	502.5
	151	2149	50.120	503.6	50.095	503.1	50.050	503.8	503.5	501.8	492.0	505.4	504.0
	152	2206	50.025	501.8	50.030	501.9	49.930	501.4	501.7	500.1	492.0	503.8	502.0
	153	2229	50.020	501.7	50.010	501.5	49.940	501.6	501.6	499.8	491.7	503.5	502.0
	154	2319	49.940	500.1	49.935	500.0	49.860	500.0	500.0	498.7	491.5	502.2	500.3
	155	2342	49.950	500.3	49.935	500.0	49.870	500.2	500.2	498.3	491.2	502.2	500.3
	156	2359	49.980	500.9	49.960	500.5	49.895	500.7	500.7	499.0	491.1	502.9	501.0
8/15/60	157	0018	49.975	500.8	49.960	500.5	49.890	500.6	500.6	499.0	491.1	502.9	501.0
	158	0034	49.975	500.8	49.960	500.5	49.890	500.6	500.6	499.0	491.2	502.9	501.0

Blanks in data columns indicate data was not recorded.

DUQUESNE LIGHT COMPANY
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TABLE IV

REACTOR COOLANT LOOP PRESSURE WITH CORRECTIONS *

Run No.	Indicated Pressure					Pressure Corrections					Average Corrected Press. (psig)
	1A	1B	1C	1D	Avg.	1A	1B	1C	1D	Avg.	
1	1810	----	1810	1840	1820	- 8	--	- 13	- 36	- 19	1801
2	1810	----	1810	1850	1823	- 8	--	- 13	- 36	- 19	1804
3	1810	----	1810	1850	1823	- 8	--	- 13	- 36	- 19	1804
4	1810	----	1820	1850	1827	- 8	--	- 13	- 36	- 19	1808
5	1810	----	1820	1850	1827	- 8	--	- 13	- 36	- 19	1808
6	1810	----	1820	1850	1827	- 8	--	- 13	- 36	- 19	1808
7	1800	----	1800	1840	1813	- 8	--	- 13	- 36	- 19	1794
8	1800	----	1800	1840	1813	- 8	--	- 13	- 36	- 19	1794
9	1800	----	1800	1840	1813	- 8	--	- 13	- 36	- 19	1794
10	1800	----	1800	1840	1813	- 8	--	- 13	- 36	- 19	1794
11	1800	----	1800	1840	1813	- 8	--	- 13	- 36	- 19	1794
12	1800	----	1800	1840	1813	- 8	--	- 13	- 36	- 19	1794
13	1800	----	1800	1840	1813	- 8	--	- 13	- 36	- 19	1794
14	1800	----	1800	1840	1813	- 8	--	- 13	- 36	- 19	1794
15	1800	----	1800	1840	1813	- 8	--	- 13	- 36	- 19	1794
16	1800	----	1800	1840	1813	- 8	--	- 13	- 36	- 19	1794
17	1800	----	1800	1840	1813	- 8	--	- 13	- 36	- 19	1794
18	1800	----	1800	1840	1813	- 8	--	- 13	- 36	- 19	1794
19	1800	----	1800	1840	1813	- 8	--	- 13	- 36	- 19	1794
20	1800	----	1810	1850	1820	- 8	--	- 13	- 36	- 19	1801
21	1800	----	1810	1850	1820	- 8	--	- 13	- 36	- 19	1801
22	1800	----	1810	1850	1820	- 8	--	- 13	- 36	- 19	1801
23	1800	----	1810	1850	1820	- 8	--	- 13	- 36	- 19	1801
24	1800	----	1810	1850	1820	- 8	--	- 13	- 36	- 19	1801
25	1800	----	1800	1850	1817	- 8	--	- 13	- 36	- 19	1798
26	1800	----	1810	1850	1820	- 8	--	- 13	- 36	- 19	1801
27	1800	----	1810	1850	1820	- 8	--	- 13	- 36	- 19	1801
28	1800	----	1810	1850	1820	- 8	--	- 13	- 36	- 19	1801
29	1800	----	1810	1850	1820	- 8	--	- 13	- 36	- 19	1801
30	1800	----	1800	1850	1817	- 8	--	- 13	- 36	- 19	1798
31	1800	----	1800	1850	1817	- 8	--	- 13	- 36	- 19	1798
32	1800	----	1800	1850	1817	- 8	--	- 13	- 36	- 19	1798
33	1800	----	1800	1850	1817	- 8	--	- 13	- 36	- 19	1798
34	1800	----	1800	1850	1817	- 8	--	- 13	- 36	- 19	1798
35	1800	----	1800	1850	1817	- 8	--	- 13	- 36	- 19	1798

* Corrections from DLCS 3360101.

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TABLE IV (cont'd)

REACTOR COOLANT LOOP PRESSURE WITH CORRECTIONS *

Run No.	Indicated Pressure					Pressure Corrections					Average Corrected Press. (psig)
	1A	1B	1C	1D	Avg.	1A	1B	1C	1D	Avg.	
36	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
37	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
38	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
39	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
40	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
41	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
42	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
43	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
44	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
45	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
46	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
47	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
48	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
49	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
50	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
51	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
52	1800	----	1800	1850	1817	- 8	--	- 15	- 35	- 19	1798
53	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
54	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
55	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
56	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
57	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
58	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
59	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
60	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
61	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
62	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
63	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
64	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
65	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
66	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
67	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
68	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
69	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
70	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794

* Corrections from DLCS 3360101.

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TABLE IV (cont'd)

REACTOR COOLANT LOOP PRESSURE WITH CORRECTIONS *

Run No.	Indicated Pressure					Pressure Corrections					Average Corrected Press. (psig)
	1A	1B	1C	1D	Avg.	1A	1B	1C	1D	Avg.	
71	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
72	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
73	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
74	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
75	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
76	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
77	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
78	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
79	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
80	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
81	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
82	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
83	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
84	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
85	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
86	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
87	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
88	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
89	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
90	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
91	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
92	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
93	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
94	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
95	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
96	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
97	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
98	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
99	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
100	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
101	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
102	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
103	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
104	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
105	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794

* Corrections from DLCS 3360101.

TABLE IV (cont'd)

REACTOR COOLANT LOOP PRESSURE WITH CORRECTIONS *

Run No.	Indicated Pressure					Pressure Corrections					Average Corrected Press. (psig)
	1A	1B	1C	1D	Avg.	1A	1B	1C	1D	Avg.	
106	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
107	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
108	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
109	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
110	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
111	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
112	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
113	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
114	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
115	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
116	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
117	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
118	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
119	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
120	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
121	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
122	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
123	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
124	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
125	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
126	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
127	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
128	1800	----	1800	1840	1813	- 8	--	- 15	- 35	- 19	1794
129	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
130	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
131	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
132	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
133	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
134	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
135	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
136	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
137	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
138	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
139	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
140	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804

* Corrections from DLCS 3360101.

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TABLE IV (cont'd)

REACTOR COOLANT LOOP PRESSURE WITH CORRECTIONS *

Run No.	Indicated Pressure					Pressure Corrections					Average Corrected Press. (psig)
	1A	1B	1C	1D	Avg.	1A	1B	1C	1D	Avg.	
141	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
142	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
143	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
144	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
145	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
146	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
147	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
148	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
149	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
150	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
151	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
152	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
153	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
154	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
155	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
156	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
157	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804
158	1810	----	1810	1850	1823	- 8	--	- 15	- 35	- 19	1804

* Corrections from DLCS 3360101.

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TABLE V

Run No.	Reactor Coolant Loop Flow 1C lb/hr x 10 ⁶	Reactor Coolant Pump D/P*	
		1A psid	1D psid
1-2	7.52	----	----
3-8	7.52	107	85
9-14	7.51	107	85
15	7.50	107	85
16	7.51	107	85
17-20	7.51	00S	00S
21 - 26	7.50	00S	00S
27 - 52	7.51	00S	00S
53	7.51	106	84
54	7.50	106	84
55	7.50	107	84
56	7.50	107	84
57	7.51	107	84
58	7.51	107	84
59	7.51	107	84
60 - 66	7.51	106	84
67	7.52	107	84
68	7.51	107	84
69	7.51	107	84
70	7.51	107	84
71	7.51	107	84
72	7.50	107	84
73	7.51	107	84
74	7.51	107	84
75 - 133	7.52	107	84
134 - 158	7.52	107	85

* 1A and 1D Loop pump D/P's recorded in lieu of loop flow. 1A and 1D loop flow indicators were out of service.

TABLE VI

TABULATION OF INTEGRATED AREAS FOR FIGURE 3

Rod Ht. In.	Plan. Rdg. In. ²	* Constant $\rho/\text{in} \times \text{in}/\text{in}^2$	Reactivity $\rho \times 10^{-3}$
4	0.18	16×10^{-4}	.288
8	0.76	16×10^{-4}	1.216
12	1.96	16×10^{-4}	3.136
16	4.20	16×10^{-4}	6.720
20	7.52	16×10^{-4}	12.032
24	11.56	16×10^{-4}	18.496
28	15.68	16×10^{-4}	25.088
32	19.78	16×10^{-4}	31.648
36	23.73	16×10^{-4}	37.968
40	27.51	16×10^{-4}	44.016
44	31.09	16×10^{-4}	49.744

* This constant was obtained from the curve of $\Delta\rho/\Delta H$ versus rod height. One inch of the "Y" axis is equal to 4×10^{-4} and one inch of the "X" axis is equal to 4 inches of rod height, therefore one square inch as measured by the planimeter is equal to $4 \times 10^{-4} \rho/\text{in} \times 4 \text{ in.}$ or a constant of $16 \times 10^{-4} \rho/\text{inch} \times \text{in}/\text{in}^2$.

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TABLE VII

Date	Time	Run No.	Rod Height	Inverter Position		Amt. of Change Inches	Direction
				2	6		
8/13/60	1215		37.95	0.048	0.120		
	1225	1	38.45	0.048	0.120	0.50	Up
	1234	2	38.45	0.048	0.120	0	
	1239	3	39.95	0.048	0.120	0.50	Up
	1300	4	39.95	0.048	0.120	0	
	1308	5	39.95	0.048	0.120	0	
	1317	6	41.20	0.048	0.120	0.25	Up
	1325	7	41.20	0.048	0.120	0	
	1352	8	41.95	0.048	0.120	0.75	Up
	1402	9	41.95	0.048	0.120	0	
	1415	10	42.70	0.048	0.120	0.75	Up
	1423	11	42.70	0.048	0.120	0	
	1435	12	42.70	0.048	0.120	0	
	1500	13	43.95	0.048	0.120	1.25	Up
	1515	14	43.95	0.048	0.120	0	
	1525	15	43.95	0.048	0.120	0	
	1535	16	43.95	0.048	0.120	0	
	1617	17	44.75	0.098	0.170	0.80	Up
	1629	18	45.00	0.098	0.170	0.25	Up
	1638	19	44.75	0.098	0.170	0.25	Down
	1647	20	45.00	0.098	0.170	0.25	Up
	1702	21	44.75	0.098	0.170	0.25	Down
	1716	22	45.00	0.098	0.170	0.25	Up
	1726	23	44.75	0.098	0.170	0.25	Down
	1736	24	45.00	0.098	0.170	0.25	Up
	1746	25	44.75	0.098	0.170	0.25	Down
	1756	26	45.00	0.098	0.170	0.25	Up
	1816	27	44.75	0.098	0.170	0.25	Down
	1826	28	44.25	0.098	0.170	0.50	Down
	1839	29	44.25	0.098	0.170	0	
	1910	30	43.75	0.098	0.170	0.50	Down
	1926	31	44.25	0.098	0.170	0.50	Up
	1937	32	43.75	0.098	0.170	0.50	Down
	1953	33	43.25	0.098	0.170	0.50	Down
	2011	34	43.75	0.098	0.170	0.50	Up
	2020	35	43.25	0.098	0.170	0.50	Down
	2036	36	43.25	0.098	0.170	0	
	2045	37	42.50	0.098	0.170	0.75	Down
	2058	38	42.50	0.098	0.170	0	

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Date	Time	Run No.	Rod Height	Inverter Position		Amt. of Change Inches	Direction
				2	6		
8/13/60	2114	39	42.50	0.098	0.170	0	
	2131	40	42.50	0.098	0.170	0	
	2140	41	41.75	0.098	0.170	0.75	Down
	2153	42	41.75	0.098	0.170	0	
	2205	43	41.75	0.098	0.170	0	
	2213	44	41.00	0.098	0.170	0.75	Down
	2226	45	41.00	0.098	0.170	0	
	2240	46	41.00	0.098	0.170	0	
	2248	47	40.25	0.098	0.170	0.75	Down
	2303	48	40.25	0.098	0.170	0	
	2320	49	40.25	0.098	0.170	0	
	2329	50	39.50	0.098	0.170	0.75	Down
	2342	51	39.50	0.098	0.170	0	
	2354	52	39.50	0.098	0.170	0	
8/14/60	0010	53	38.50	0.098	0.170	1.00	Down
	0030	54	38.50	0.098	0.170	0	
	0045	55	38.50	0.098	0.170	0	
	0055	56	37.50	0.098	0.170	1.00	Down
	0115	57	37.50	0.098	0.170	0	
	0136	58	37.50	0.098	0.170	0	
	0140	59	36.75	0.098	0.170	0.75	Down
	0150	60	36.75	0.098	0.170	0	
	0200	61	36.75	0.098	0.170	0	
	0210	62	36.00	0.098	0.170	0.75	Down
	0220	63	36.00	0.098	0.170	0	
	0230	64	36.00	0.098	0.170	0	
	0250	65	35.00	0.098	0.170	1.00	Down
	0300	66	35.00	0.098	0.170	0	
	0305	67	35.00	0.098	0.170	0	
	0310	68	34.25	0.098	0.170	0.75	Down
	0325	69	34.25	0.098	0.170	0	
	0340	70	34.25	0.098	0.170	0	
	0350	71	33.50	0.098	0.170	0.75	Down
	0400	72	33.50	0.098	0.170	0	
	0410	73	33.50	0.098	0.170	0	
	0421	74	32.50	0.098	0.170	1.00	Down
	0440	75	32.50	0.098	0.170	0	
	0445	76	32.50	0.098	0.170	0	

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Date	Time	Run No.	Rod Height	Inverter Position		Amt. of Change Inches	Direction
				2	6		
8/14/60	0455	77	31.75	0.098	0.170	0.75	Down
	0505	78	31.75	0.098	0.170	0	
	0518	79	31.75	0.098	0.170	0	
	0525	80	31.00	0.098	0.170	0.75	Down
	0540	81	31.00	0.098	0.170	0	
	0550	82	31.00	0.098	0.170	0	
	0555	83	30.25	0.098	0.170	0.75	Down
	0610	84	30.25	0.098	0.170	0	
	0620	85	30.25	0.098	0.170	0	
	0630	86	29.50	0.098	0.170	0.75	Down
	0640	87	29.50	0.098	0.170	0	
	0650	88	29.50	0.098	0.170	0	
	0655	89	28.75	0.098	0.170	0.75	Down
	0710	90	28.75	0.098	0.170	0	
	0725	91	28.75	0.098	0.170	0	
	0740	92	27.75	0.098	0.170	1.00	Down
	0755	93	27.75	0.098	0.170	0	
	0805	94	27.75	0.098	0.170	0	
	0822	95	27.00	0.098	0.170	0.75	Down
	0836	96	27.00	0.098	0.170	0	
	0848	97	27.00	0.098	0.170	0	
	0857	98	26.25	0.098	0.170	0.75	Down
	0909	99	26.25	0.098	0.170	0	
	0920	100	26.25	0.098	0.170	0	
	0931	101	25.25	0.098	0.170	1.00	Down
	0945	102	25.25	0.098	0.170	0	
	1000	103	25.25	0.098	0.170	0	
	1034	104	24.50	0.098	0.170	0.75	Down
	1043	105	24.50	0.098	0.170	0	
	1054	106	23.75	0.098	0.170	0.75	Down
	1109	107	23.75	0.098	0.170	0	
	1124	108	23.75	0.098	0.170	0	
	1133	109	23.00	0.098	0.170	0.75	Down
	1146	110	23.00	0.098	0.170	0	
	1157	111	23.00	0.098	0.170	0	
	1208	112	22.25	0.098	0.170	0.75	Down
	1220	113	22.25	0.098	0.170	0	
	1231	114	22.25	0.098	0.170	0	

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TABLE VII (cont'd)

Date	Time	Run No.	Rod Height	Inverter Position		Amt. of Change Inches	Direction
				2	6		
8/14/60	1242	115	21.25	0.098	0.170	1.00	Down
	1256	116	21.25	0.098	0.170	0	
	1307	117	21.25	0.098	0.170	0	
	1319	118	21.25	0.098	0.170	0	
	1331	119	20.25	0.098	0.170	1.00	Down
	1343	120	20.25	0.098	0.170	0	
	1354	121	20.25	0.098	0.170	0	
	1406	122	20.25	0.098	0.170	0	
	1417	123	19.25	0.098	0.170	1.00	Down
	1430	124	19.25	0.098	0.170	0	
	1444	125	19.25	0.098	0.170	0	
	1454	126	19.25	0.098	0.170	0	
	1507	127	18.25	0.098	0.170	1.00	Down
	1525	128	18.25	0.098	0.170	0	
	1538	129	18.25	0.098	0.170	0	
	1557	130	18.25	0.098	0.170	0	
	1602	131	17.25	0.098	0.170	1.00	Down
	1615	132	17.25	0.098	0.170	0	
	1628	133	17.25	0.098	0.170	0	
	1639	134	17.25	0.098	0.170	0	
	1651	135	16.25	0.098	0.170	1.00	Down
	1704	136	16.25	0.098	0.170	0	
	1717	137	16.25	0.098	0.170	0	
	1732	138	16.25	0.098	0.170	0	
	1744	139	15.25	0.098	0.170	1.00	Down
	1758	140	15.25	0.098	0.170	0	
	1810	141	15.25	0.098	0.170	0	
	1823	142	14.25	0.098	0.170	1.00	Down
	1842	143	14.25	0.098	0.170	0	
	1858	144	14.25	0.098	0.170	0	
	1914	145	13.00	0.098	0.170	1.25	Down
	1931	146	13.00	0.098	0.170	0	
	2000	147	11.75	0.098	0.170	1.25	Down
	2016	148	11.75	0.098	0.170	0	
	2035	149	11.75	0.098	0.170	0	
	2125	150	9.50	0.098	0.170	2.25	Down
	2149	151	9.50	0.098	0.170	0	
	2206	152	9.50	0.098	0.170	0	
	2228	153	1.00	0.098	0.170	8.50	Down

XENON TRANSIENT TESTS

Results Prepared By J. G. Greene per WJK

Results Reviewed By Satter J. Kearns

Approved (Duquesne Light Company) H. A. Sartel Date 1-30-61