

MASTER

DUQUESNE LIGHT COMPANY
SHIPPINGPORT ATOMIC POWER STATION

TEST RESULTS

DLCS 2390401
T-641317

PERIODIC WASTE DISPOSAL SYSTEM MATERIAL BALANCE TEST

CORE I SEED 1

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DLCS 2390401

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CORE I SEED 1

Purpose

To determine the adequacy of storage capacity and operating procedures of the RWD System during a reactor refueling operation.

Conclusions

The most important difficulty encountered during this refueling operation was the excessive amount of contaminated wastes accumulated from the "hot" laundry. These "hot" wastes exceeded the storage capacity of the Special Waste Tanks of the Waste Disposal System necessitating use of the four surge and decay tanks as storage tanks. These tanks ordinarily handle reactor liquid wastes only. Also associated with this problem was the further overburdening of the already overburdened evaporator. The capacity of the evaporator was generally inadequate to handle the amount of special liquid wastes and chemical wastes accumulated.

The total volume of waste discharged to the effluent channel during the refueling period from November 2, 1959 to March 15, 1960, was 1,102,800 gallons or 32.31 percent of the design volume for a refueling period. Total activity for this 135-day period was 95,460.00 microcuries or 19.73 percent of the design activity for an equivalent 135-day refueling period. Total tritium activity was 1.11 percent of the design activity. The volume of non-active waste discharged to the Ohio River was 64.81 percent of the estimated or design volume. Special waste discharged to the River was 102.83 percent of the design volume, and the Reactor Plant effluent (liquid waste from Reactor only) was 92.83 percent of the design volume available for an equivalent 43 day period. Due to the excessive wastes from the "hot" laundry, the volume of special waste was slightly over the designed for discharge.

The activity of the non-active waste discharged to the effluent channel was 195.90 percent of its estimated activity. Special waste activity was 53.90 percent of design activity, and the Reactor Plant effluent was 103.29 percent of the design activity for an equivalent 135-day period. However, the maximum daily discharge for any one day was 2856.37 microcuries on February 10, 1960. This was 54 percent under the allowable daily maximum of 6200 microcuries. Even though the activity of the non-active and Reactor Plant effluent systems was over the designed values, the total activity was well under the daily activity allowed by the State of Pennsylvania in Discharge Permit No. 1832.

Operating pressures of the various drums were well within their design pressures.

TEST RESULTS DLCS 2390401

T-641317

PERIODIC WASTE DISPOSAL SYSTEM MATERIAL BALANCE TEST

The maximum level of all the tanks combined for any one day was 60 per cent on December 3, 1960.

Description of Test Equipment and Test Procedure

During the refueling operation data were recorded to determine a material balance in order to ascertain design parameters in comparison to operating requirements of the Radioactive Waste Disposal Plant during a refueling operation.

Tank level and drum pressure data were recorded at the initiation of refueling operations, once every 24 hours during refueling and also at the completion of refueling operations.

Gross Beta-Gamma activity of tanks and drums was recorded prior to commencing and after the completion of refueling operations.

Results

DLCS 2390401 was performed between 11/2/59 and 3/15/60, a total of 135 days.

The Waste Disposal facilities at Shippingport were designed to collect, process and dispose of all radioactive wastes encountered during the operation of the Station. The plant handles liquid, gaseous and both combustible and non-combustible solid wastes. This must be done in a manner consistent with providing the maximum degree of safety for the public and operating personnel without restricting the capability of the Station. Consequently the design is conservative and provides flexibility for handling waste materials. The guide lines for the handling and disposal of radioactive waste and radiation exposure limits for operating personnel were obtained from applicable government documents on radiation exposure. As is the case for chemical and sanitary wastes, maximum permissible concentrations (MPC) for radioactive environmental pollutants have been established by the National Bureau of Standards (NBS) Handbook No. 52, "Maximum Permissible Amounts of Radioisotopes In the Human Body and Maximum Permissible Concentration In Air and Water", NBS Handbook No. 61, "Regulation of Radiation Exposure by Legislative Means" and by Pennsylvania Department of Health Regulation 433. The major design aspect was to insure that these tolerance values were not exceeded.

Using the volume figures as determined by design considerations plus the estimated leakage and sampling rate, the yearly volume of reactor plant effluents was calculated and a monthly average volume determined. From this estimated coolant turnover rate and from the expected efficiency of the demineralizers in the coolant purification system, the maximum volatile and non-volatile activity levels of the coolant were predicted.

It was also known that both liquid and solid radioactive wastes would be evolved in the laboratories, personnel change rooms and decontamination facilities located in the reactor plant service building. Liquid volumes could be expected to vary

PERIODIC WASTE DISPOSAL SYSTEM MATERIAL BALANCE TEST

greatly, depending on the operational status of the reactor plant, ie., power operation, maintenance, refueling, etc. There was little practical experience available to aid in predicting activity levels or volumes. Liquid wastes were identified by source and a maximum expected activity level was predicted for each. They were then segregated into three classes and average monthly volumes were estimated. The quantities of both combustible and non-combustible solid radioactive wastes were estimated although no realistic figure for activity levels could be derived. Contaminated items of plant equipment were to be handled on an individual basis.

Wastes were discharged in accordance with Industrial Wastes Permit Number 1832 granted on November 1, 1957, by the Department of Health, Sanitary Water Board, Commonwealth of Pennsylvania. This experimental permit granted by the Commonwealth reads as follows: "The final wastes as discharged to the waters of the Commonwealth shall at no time contain more radioactivity than 10^{-8} microcuries per milliliter above that of the intake water of the Ohio River (exclusive of tritium)." This permit allows Duquesne Light Company to discharge 1590 microcuries per day on the average over a 365 day period with a maximum discharge for any one day of 6200 microcuries. This is exclusive of tritium. For tritium, the allowable amount of discharge shall not exceed 10 curies per day average over a 365 day period with a maximum discharge of 50 curies per day.

The actual volume of non-active liquid wastes was 65 percent of the design or estimated volume for an equivalent 135 day period. Special liquid waste volume was 102.83 percent of design. During refueling an excessive (greater than that expected) amount of "hot" laundry liquid waste was experienced which overburdened the capacity of the special waste tanks. A review of the data (Table II) indicates that the greatest volume of this waste was transferred to the four surge and decay tanks. Ordinarily these wastes would have been transferred to the chemical waste tanks and processed through the evaporator. The chemical waste tanks themselves, however, were filled to capacity with wastes which could not be processed because of evaporator difficulties. Level and flow control problems of the evaporator caused prolonged periods of idleness but even when the unit was operating it was never at design capacity. The evaporator operating continuously at design capacity would undoubtedly have relieved somewhat the problem of handling these special wastes. However, it is believed that even such operation as this would not have been sufficient to handle the amounts of special wastes encountered and only increased evaporator capacity and/or storage facilities would be adequate to solve the problem.

The special wastes, which were transferred to the four surge and decay tanks, then had to be processed through the four mixed bed ion exchangers in series. These wastes frequently saturated the resin beds of the ion exchangers which in turn frequently delayed further processing of these fluids.

The actual volume of reactor plant effluent wastes was determined by adding together the waste volume discharged from the four surge and decay tanks, the two test tanks and the volume in the canal pits to the effluent channel. Blanket and seed assembly removal from the core was performed while the core was under

TEST RESULTS DLCS 2390401

T-641317

PERIODIC WASTE DISPOSAL SYSTEM MATERIAL BALANCE TEST

water. After all the required fuel assemblies had been removed, the canal water was pumped directly to the effluent channel via four mixed bed ion exchangers which removed the soluble impurities. This was permitted because the radioactivity of the water was less than 1.0×10^{-8} $\mu\text{c}/\text{ml}$. Any liquid waste discharged to the effluent channel must have a radioactivity level of less than 1.0×10^{-8} $\mu\text{c}/\text{ml}$ above background as indicated by NBS Handbook 52. The actual percentage of the designed volume used by the components of the reactor plant effluent system is as follows:

- a. Surge and decay tanks - 62.07 percent of designed volume
- b. Test Tanks - 30.76 percent of designed volume
- c. Canal Water - 468.20 percent of designed volume

It will be noted that the total of the combined percentages is 461.03 percent in excess of the designed volume. Because the canal water is considered as a special application of the system, it will not be considered in the final average. Therefore, the final average of the actual volume processed is 92.83 percent of the designed volume for an equivalent 43 day period.

Percentages of tank levels were taken prior to commencing refueling, daily during refueling and immediately after completion of refueling (for this data consult Table XI). The maximum level for any one day for each type of tank is given in the following listing:

- a. Surge and Decay - 4 Tanks - 58.5 percent of total capacity on March 6, 1960.
- b. Test - 2 Tanks - 100 percent of total capacity on December 13, 1959.
- c. Spray Recycle - 1 Tank - 87 percent of total capacity on January 5, 1960 and January 6, 1960.
- d. Reactor Plant Container Gravity Drain - 1 Tank - 100 percent of total capacity on March 13, 1960.
- e. Flash - 1 Tank - 65.4 percent of total capacity on January 19, 23, 28, 30, February 1, 9, 12, 13, 1960.
- f. Blow-off - 1 Tank - 64 percent of total capacity on November 20, 1959.
- g. Chemical Waste - 2 Tanks - 89 percent of total capacity on November 25, 1959.
- h. Special Waste - 2 Tanks - 81 percent of total capacity on February 3, 1959.
- i. Non-Active Waste - 2 Tanks - 100 percent of total capacity on December 3, 1959.

The greatest percentage to total tank capacity (16 Tanks) used was 60 percent on December 3, 1959. For individual tank levels consult Table XI.

TEST RESULTS DLCS 2390401

T-641317

PERIODIC WASTE DISPOSAL SYSTEM MATERIAL BALANCE TEST

Table XI also lists pressures for the drums and tanks prior to refueling, daily during refueling and immediately after the refueling operation. A review of this data reveals that all pressures were within their designed limits except for the vent gas compressor suction.

Table X lists the designed operating pressures in addition to the minimum and maximum operating pressures for the various vessels.

Reactor plant temperature was recorded for the first four days. The temperature average for this period was 83 F (consult Table XI for daily temperature).

Gross Beta-Gamma Activity of gaseous and liquid wastes of the various drums and tanks, recorded prior to and after refueling, is listed in Table X.

It was impossible to obtain a good approximation of contaminated non-combustible material handled; also, the weight and contact activity of contaminated combustible material charged into the incinerator were not determined.

A log of events for the performance of this test are listed in Tables XII through XVIII. Table XII is a summary stating whether or not each operation, as anticipated in Approved Test Procedure, was performed. This Table also includes a list of the data that was not obtained and as required by the Approved Test Procedure. No reason can be given why this data was not taken.

Figures 1 through 6 are plots of tank volume versus percent liquid level for six tanks and Figures 7 through 9 are plots of tank capacity versus tank level for three tanks.

TEST RESULTS DLCS 2390401

T-641317

PERIODIC WASTE DISPOSAL SYSTEM MATERIAL BALANCE TEST

NON-ACTIVE LIQUID WASTE DISPOSAL SYSTEM
DESIGN PHILOSOPHY AND DATA

The non-active liquid waste disposal system provides the facilities necessary to contain, process and dispose of all neutral liquid wastes from the service building which are expected to be non-radioactive. The sources of these wastes are showers and non-active drains of laboratory sinks. All non-active wastes flow by gravity from their source in the Reactor Plant Service Building to a hold up tank in the same building. From the hold up tanks the wastes are pumped into one of two non-active waste tanks in the disposal yard. The wastes are sampled in the non-active tanks and, depending on the radioactivity content, either gravitated to the river at a maximum (and non-controlled) rate of 80 gpm or pumped into a special waste tank where it can be pumped to the river at a controlled rate of up to 25 gpm.

The estimated or designed quantity of liquid waste from the non-active waste system was 5630 gallons per day, or approximately 2,060,000 gallons annually. This volume of waste was expected to contain approximately 0.35×10^{-2} microcuries per gallon, or a total of 7300 microcuries annually.

REFUELING OPERATING DATA

During refueling, the actual volume discharged to the effluent channel was 493,815 gallons or a daily average of 3657.89 gallons for the 135 day period. This volume was 64.81 per cent of the designed volume for an equivalent period.

Total activity for the refueling period was 7989.40 microcuries or a daily average of 59.18 microcuries. This activity was 295.90 per cent of the anticipated activity for a 135 day period and 109.44 per cent of the annual designed activity of 7300 microcuries.

The discrepancy between the design data and the operational data was due to an overestimation of the volume and an underestimation of the activity of non-active wastes that would be accumulated during refueling. Shower drains furnished the largest amount of total activity.

Tables I and IV summarize non-active waste disposal for this period.

PERIODIC WASTE DISPOSAL SYSTEM MATERIAL BALANCE TEST

SPECIAL LIQUID WASTE
DESIGN PHILOSOPHY AND DATA

The special liquid waste disposal system provides the facilities necessary to contain, process and dispose of all liquid waste from the Reactor Plant Service Building to a hold up tank in the same building. All special liquid wastes flow by gravity from their source in the Reactor Plant Service Building to a hold up tank in the same building. The sources of these wastes are the laundry and special wastes laboratory drains. From the hold up tanks the wastes are pumped to one of two special waste tanks located in the Waste Disposal Yard. Here the wastes are thoroughly mixed, sampled and the gross specific activity determined. Based on the activity measurement, the waste liquid is pumped at a controlled rate to the effluent channel where it is diluted with water from the condenser discharge to the prescribed level of radioactivity. If the activity exceeds 1.9×10^{-4} $\mu\text{C}/\text{ml}$ or is so high that the tank cannot be emptied in the time available, the remaining liquid can be pumped to one of the two chemical tanks for further processing. The discharge of this waste is scheduled so as not to conflict with the discharge of any other waste liquids.

The estimated or designed quantity of liquid from the special waste system was 2950 gallons per day or an annual volume of 1,076,750 gallons. Designed annual activity of this volume of waste was 408,800 microcuries or 0.38 microcuries per gallon.

REFUELING OPERATING DATA

The total volume of special wastes during refueling was 409,516 gallons or 3033.45 gallons per day for a 135 day period. This volume was 2.83 percent in excess of the design volume for an equivalent period. The total activity for the 409,516 gallons was 81499.72 microcuries, or 46.10 percent below the design estimate for total activity for 135 days. Average daily activity was 603.70 microcuries.

During refueling the special waste tanks were required to receive an excessive amount of laundry waste, which also at first, contaminated the non-active waste. All of this high activity waste under normal operating procedures would be drained to the chemical waste tanks and processed through the evaporator. However, due to difficulties with the evaporator as previously outlined in the results, these chemical waste tanks could not handle the special waste excess because they were filled to capacity with chemical wastes. Finally, during this period the effluent header from waste disposal storage to the effluent channel ruptured delaying the discharge of waste water.

Because of the ruptured header an alternative transient method was established that permitted continued discharge of the waste disposal system. To avoid an extended shutdown of the hot laundry a substitute method of disposing of the special waste water was devised. It was resolved to drain the special waste to a sump, through strainers and then to the surge and decay tanks by education. This method alleviated the burden on the special waste tanks and reduced the activity of the water by straining and dilution to a safe contamination level; however, discharge to the effluent channel (river) was performed at a slower rate.

TEST RESULTS DLCS 2390401

T-641317

PERIODIC WASTE DISPOSAL SYSTEM MATERIAL BALANCE TEST

Special wastes are summarized in Tables II and V. Table II indicates which tanks were used for the storage of special wastes and ultimately discharged to the effluent channel.

PERIODIC WASTE DISPOSAL SYSTEM MATERIAL BALANCE TEST

REACTOR PLANT LIQUID WASTES
DESIGN DATA AND PHILOSOPHY

All liquid wastes are delivered to one of four surge and decay tanks in the Waste Disposal Yard. Each tank has a capacity of 29,100 gallons. This large storage volume is designed to provide a hold-up time of 45 days, which allows the radioactivity to decay to levels where subsequent processing can further reduce the radioactivity to the required limit. After 45 days decay the liquid is pumped from storage through the waste liquid cooler to four mixed bed ion exchangers arranged in series. From here the wastes flow to the feed-bottoms heat exchanger and then into the gas stripper where most of the volatile material (gases) is removed. The degassed liquid collects in the bottom of the stripper from where it is pumped to one of two test tanks in the Waste Disposal Yard for monitoring and subsequent discharge to the effluent channel at a controlled rate.

The disposal of fuel handling canal water is a special, infrequent case of high activity waste disposal. This water is expected to have a temperature of 100 F and a maximum non-volatile activity of about 1×10^3 dps/ml approximately the same as the mixed bed high level wastes after the 45 day decay period.

The Reactor Coolant Water is treated with lithium resins to minimize corrosion and deposits in the system. Lithium was selected in preference to other alkalis because of its good nuclear properties and the effectiveness of the lithium-hydroxyl mixed bed ion exchanger in removing high-hazard radioactive fission products from the coolant stream. The lithium atom reacts with neutrons to form an alpha particle and a tritium atom. Tritium (12 year half-life) decays very little during any reasonable hold up time. As a part of water, it cannot be removed or concentrated by distillation, chemical treatment or ion exchange. Fortunately, tritium is a relatively low-hazard isotope, compared with other isotopes, which accounts for the fact that the tolerance level allowed by the Commonwealth of Pennsylvania and recommended in NBS documents is comparatively high. The RWDS contains the tritiated water and releases it at a controlled rate. The tritiated water occurs only in the relatively low volume reactor plant effluent.

The reactor plant liquid waste system is designed for the surge and decay tanks only. The anticipated volume that these tanks would handle was established at 276,000 gallons annually. The anticipated yearly burden of radioactivity for this waste after processing was estimated at 47,450 microcuries and a tritium activity of 3650 curies.

REFUELING OPERATING DATA

The Reactor Plant Liquid Waste System was only required from November 2, 1959 to December 14, 1959 when a total of 182,419 gallons of Reactor Plant effluent or a daily volume of 4242.30 gallons as discharged to the Ohio River. This volume includes discharge from the surge and decay tanks, test tanks and fuel handling canal water and was 461.03 per cent over the designed volume for an equivalent period of 43 days.

TEST RESULTS DLCS 2390401

T-641317

PERIODIC WASTE DISPOSAL SYSTEM MATERIAL BALANCE TEST

Total activity for this period was 5795.05 microcuries. This activity was 3.67 per cent in excess of the designed activity for an equal 43 day period. Total tritium activity was 4.78 curies which was only 1.11 per cent of the designed activity for 43 days.

Following is a listing of the breakdown of the Reactor Plant effluent waste discharge for 43 days.

Type of Reactor Plant Liquid Discharge	Total Volume Discharged Gal. per 43 days	Average Volume Discharged Gal. per Day	Actual Volume Design Volume %	Total Act. μ c	Avg. Daily Act. μ c	Actual Activity Design Activity %	Tritium Curies	Act H^3 Des H^3 Curies
Surge and Decay	20182	469.35	62.07	5348.25	124.38	95.68	4.51	1.05
Test Tank	10000	232.56	30.76	425.70	9.90	7.61	0.26	.06
Canal Water	<u>152237</u>	<u>3540.39</u>	<u>468.20</u>	<u>21.10</u>	<u>.49</u>	<u>.38</u>	<u>--</u>	<u>--</u>
Total	182419	4242.30	561.03	5795.05	134.77	103.67	4.71	1.11

This system was designed primarily for use with the reactor in operation. During refueling there is basically no need for the reactor liquid effluent. Because of the excessive volume of special waste it was decided to use the surge and decay and the test tanks for storage of special wastes. Therefore, after 43 days of the refueling period, the subject tanks were used for special liquid waste.

TEST RESULTS DLCS 2390461

T-641317

PERIODIC WASTE DISPOSAL SYSTEM MATERIAL BALANCE TEST

**CHEMICAL LIQUID WASTES
DESIGN PHILOSOPHY AND DATA**

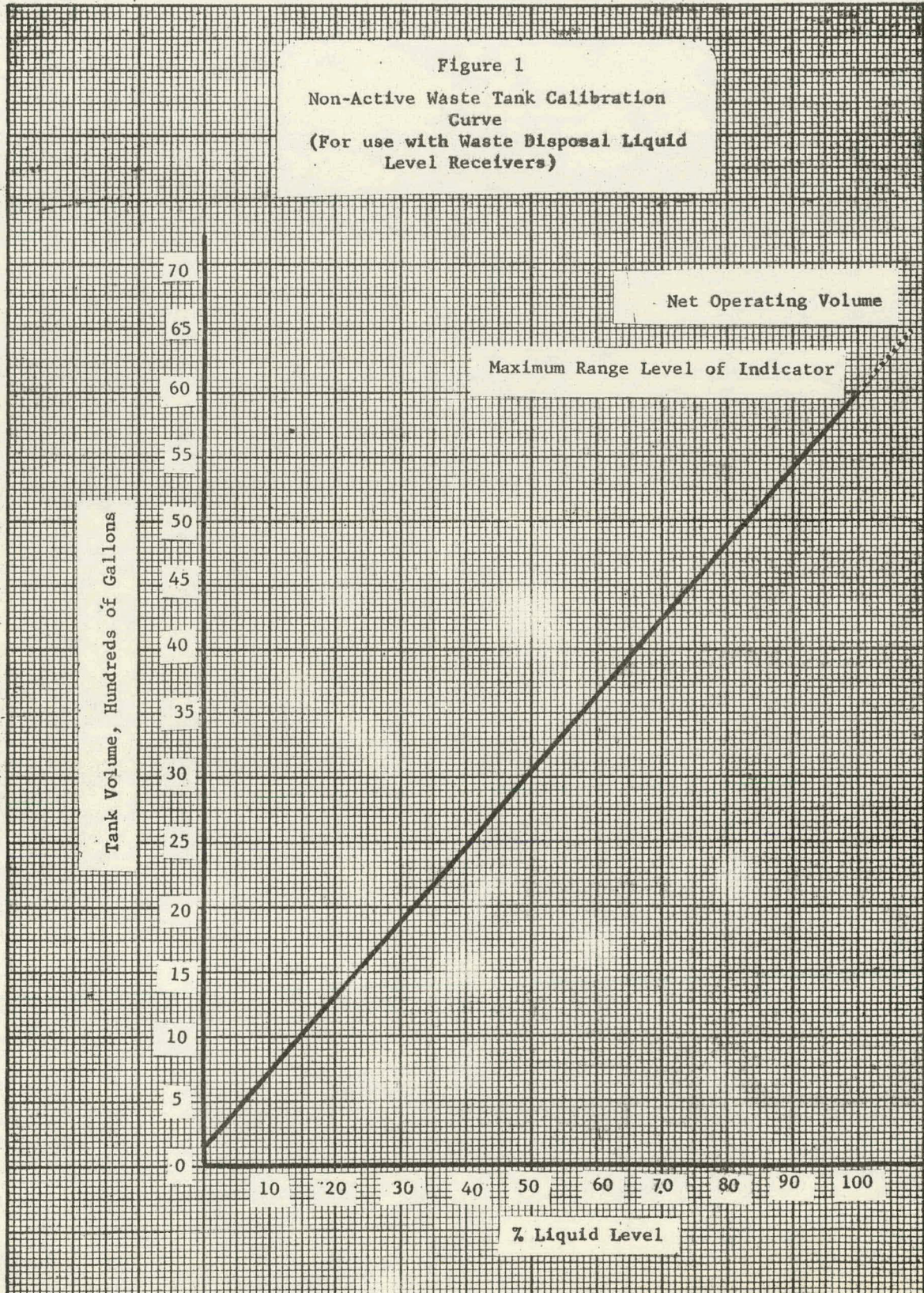
The chemical waste disposal system contains, processes and disposes of all liquid wastes from the decontamination room, sample room, cleaning booth and chromated component cooling water pump gland leakage sump if necessary, which cannot be handled by the special waste disposal system. These wastes are of low to moderate activity but high in chemical content.

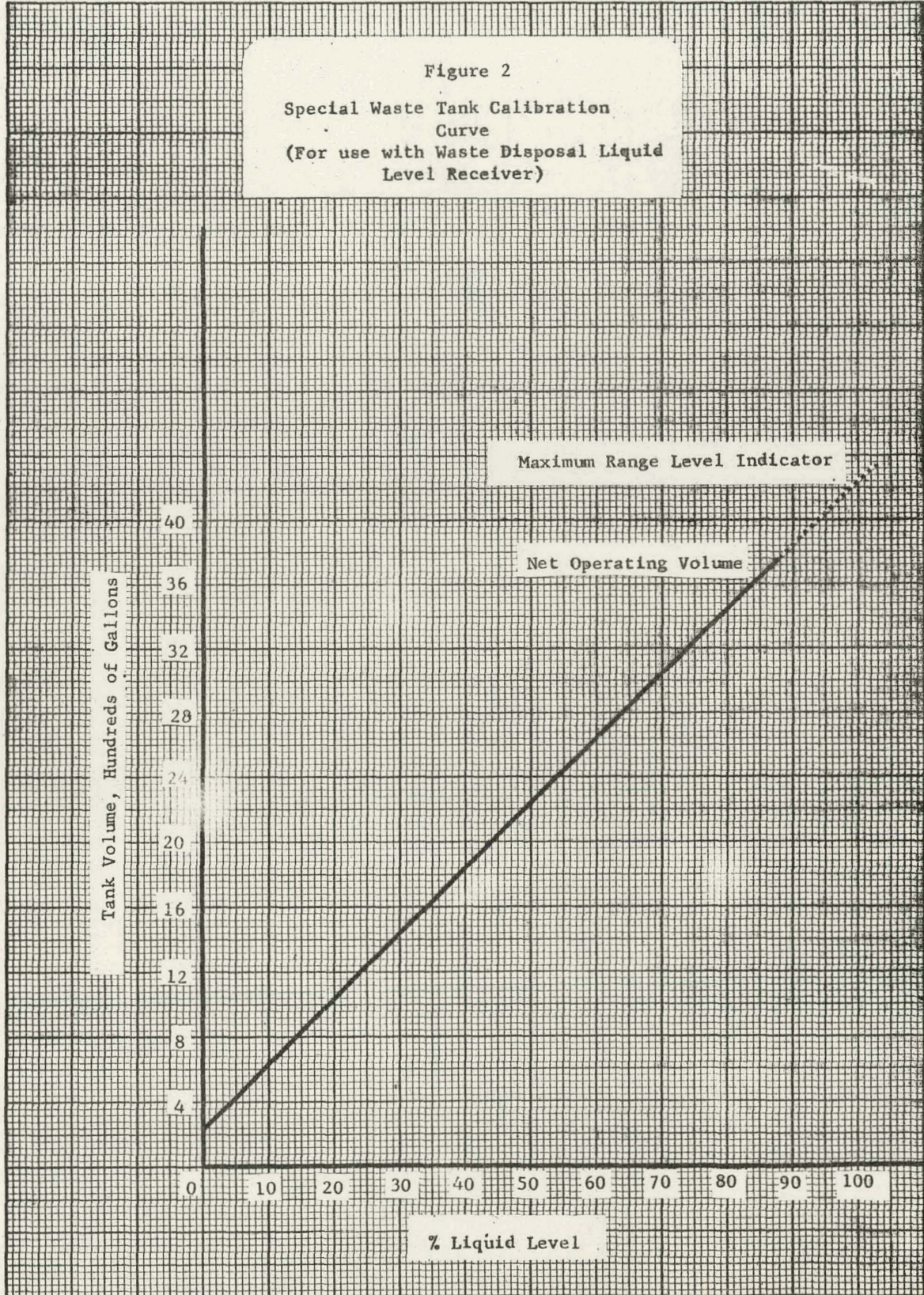
The waste liquids and floor drains from the decontamination room are collected in a sump tank in the reactor plant service building and pumped to one of two chemical waste tanks located in the basement of the waste disposal building. The contaminated drains from the equipment cleaning booth in the sample preparation room are collected in a separate sump tank and pumped to one of the two chemical waste tanks. Each of these tanks has an agitator to thoroughly mix the liquids. Before these wastes are processed, a sample is taken, the pH, chromate content and activity of the sample are measured and the necessary chemical processing carried out to effect chromate reduction and precipitation. If the radioactivity of the supernatant liquid is sufficiently low, the liquid is transferred to the special waste tanks for discharge to the effluent channel. If the radioactivity is in excess of what can be safely discharged to the river, the neutralized liquid is processed in a vapor compression evaporator. The distillate is routed to the surge tanks. The residue of either evaporation or of precipitation is mixed with cement and drummed for subsequent sea burial.

The quantity of waste from the chemical waste system was designed at 3750 gallons every 15 days or a total annual volume of 91,250 gallons. Because these tanks cannot be directly discharged into the effluent channel, there is no activity requirements to be met. These tanks are normally discharged to the special waste tanks or evaporated.

FUEL OPERATING DATA

The total volume of chemical waste processed from November 2, 1959 to March 15, 1960 was 59,400 gallons or a daily discharge rate of 440 gallons. This was 76 per cent in excess of the estimated volume for an equivalent 135 day period.





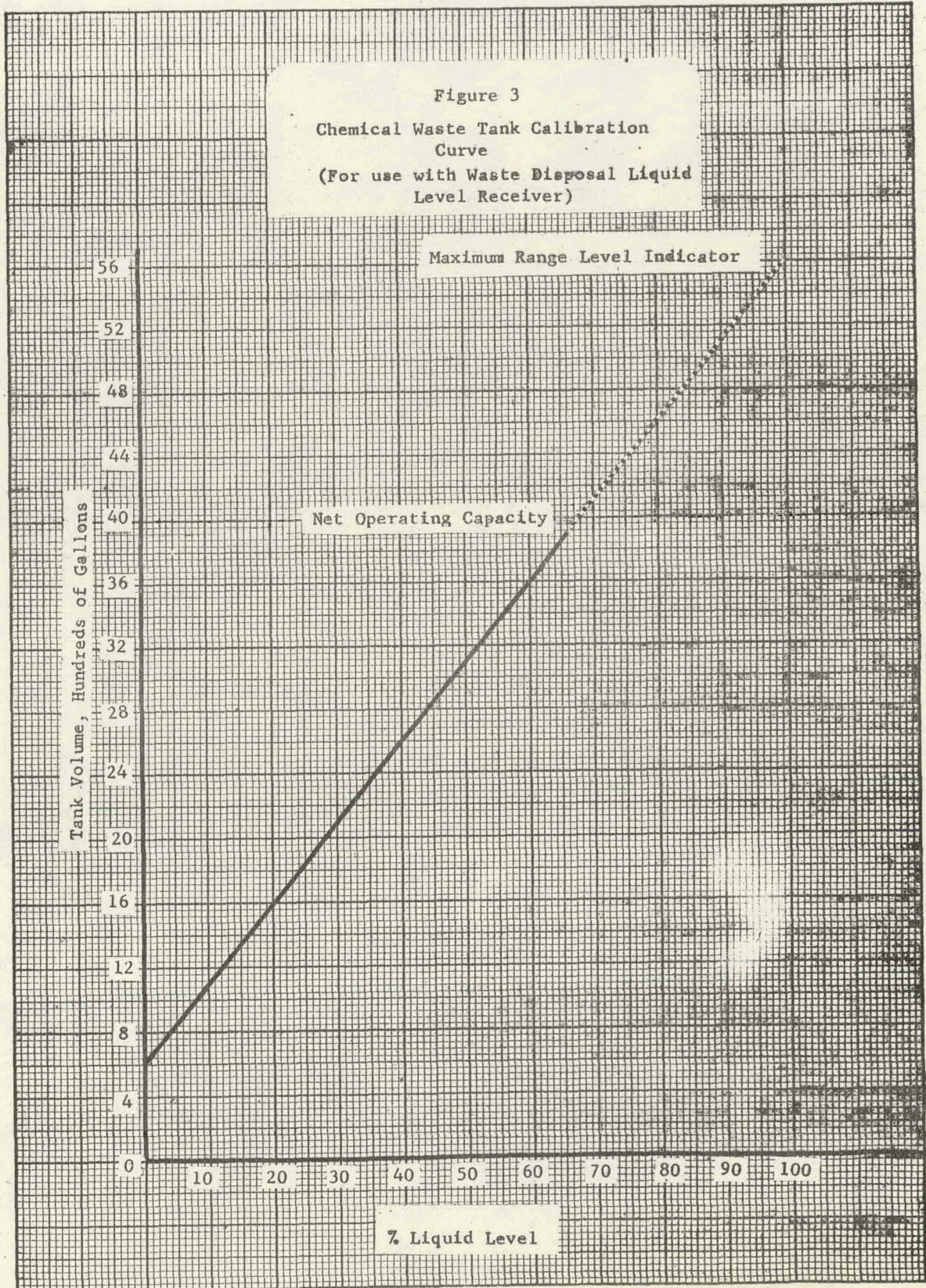


Figure 4
Surge and Decay Tank Calibration
Curve
(For use with Waste Disposal Liquid
Level Receiver)

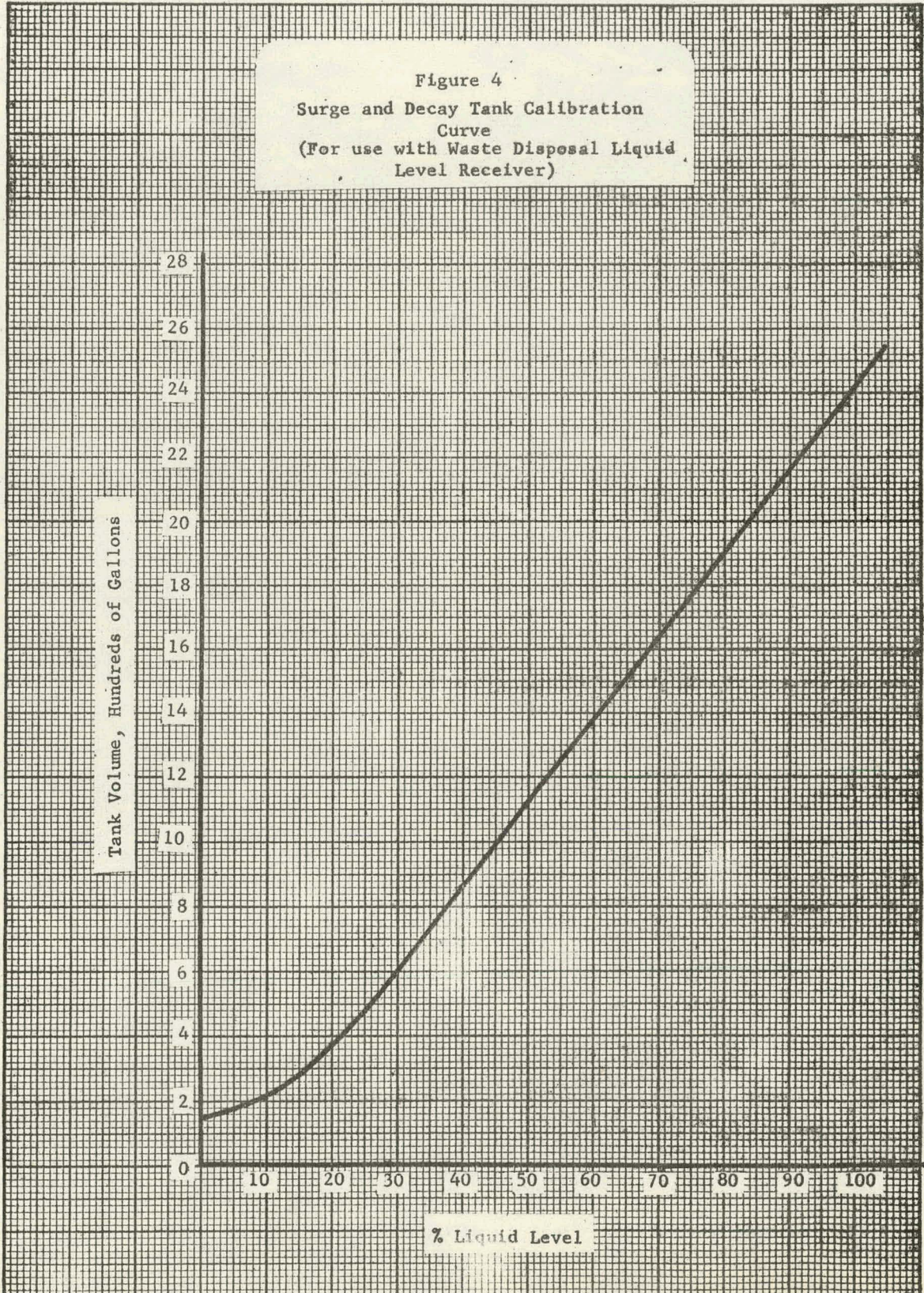
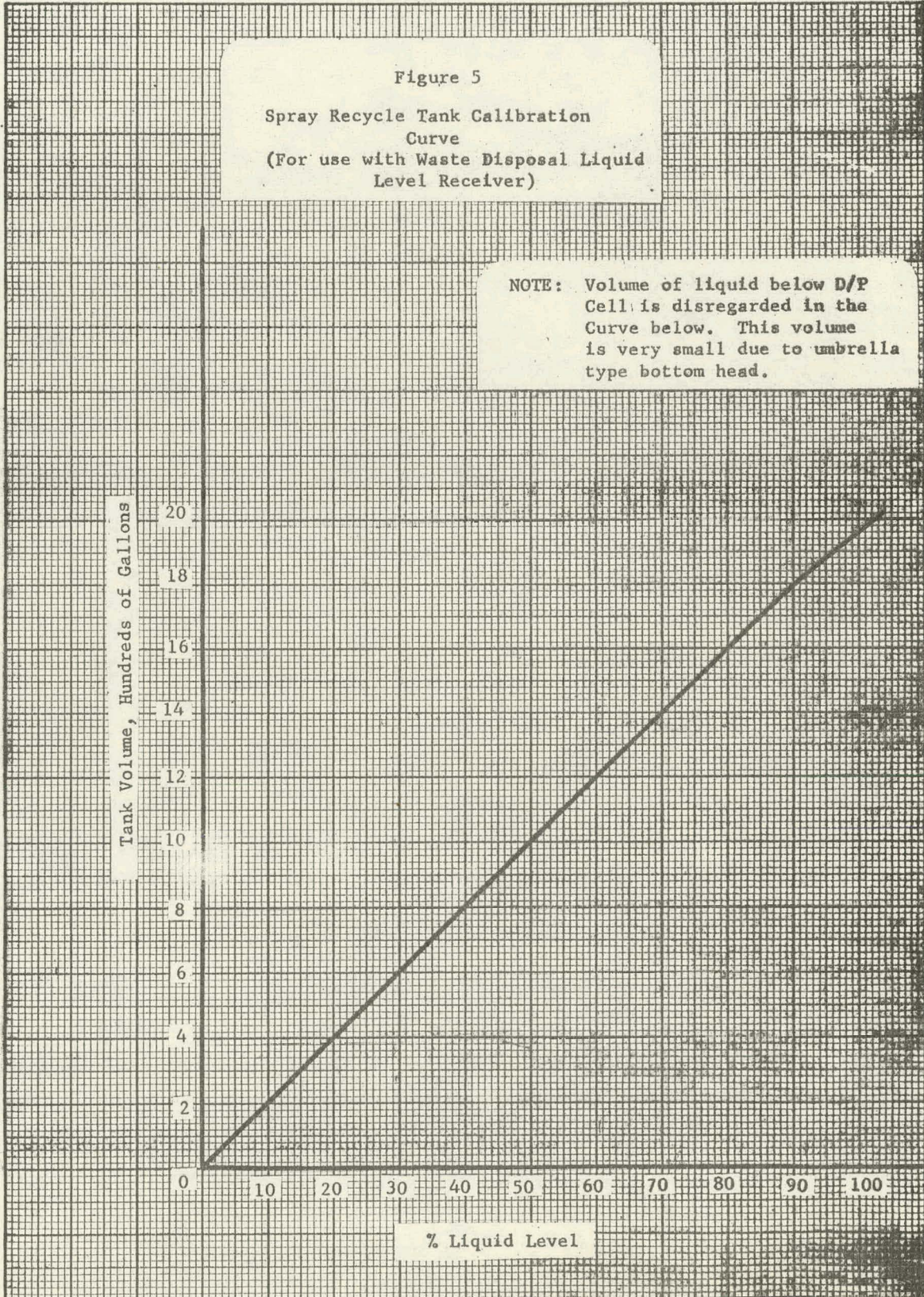
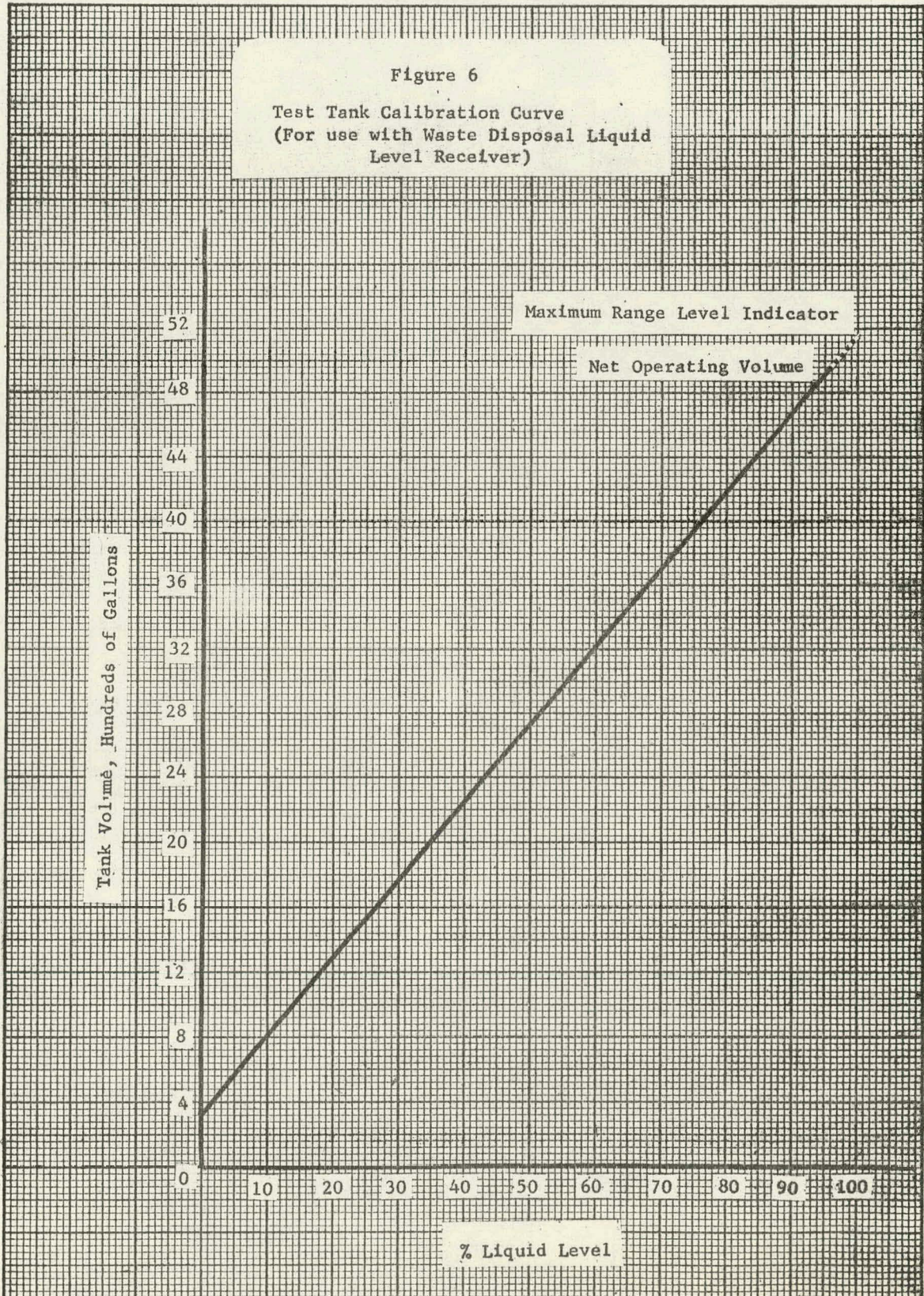


Figure 5
Spray Recycle Tank Calibration
Curve
(For use with Waste Disposal Liquid
Level Receiver)

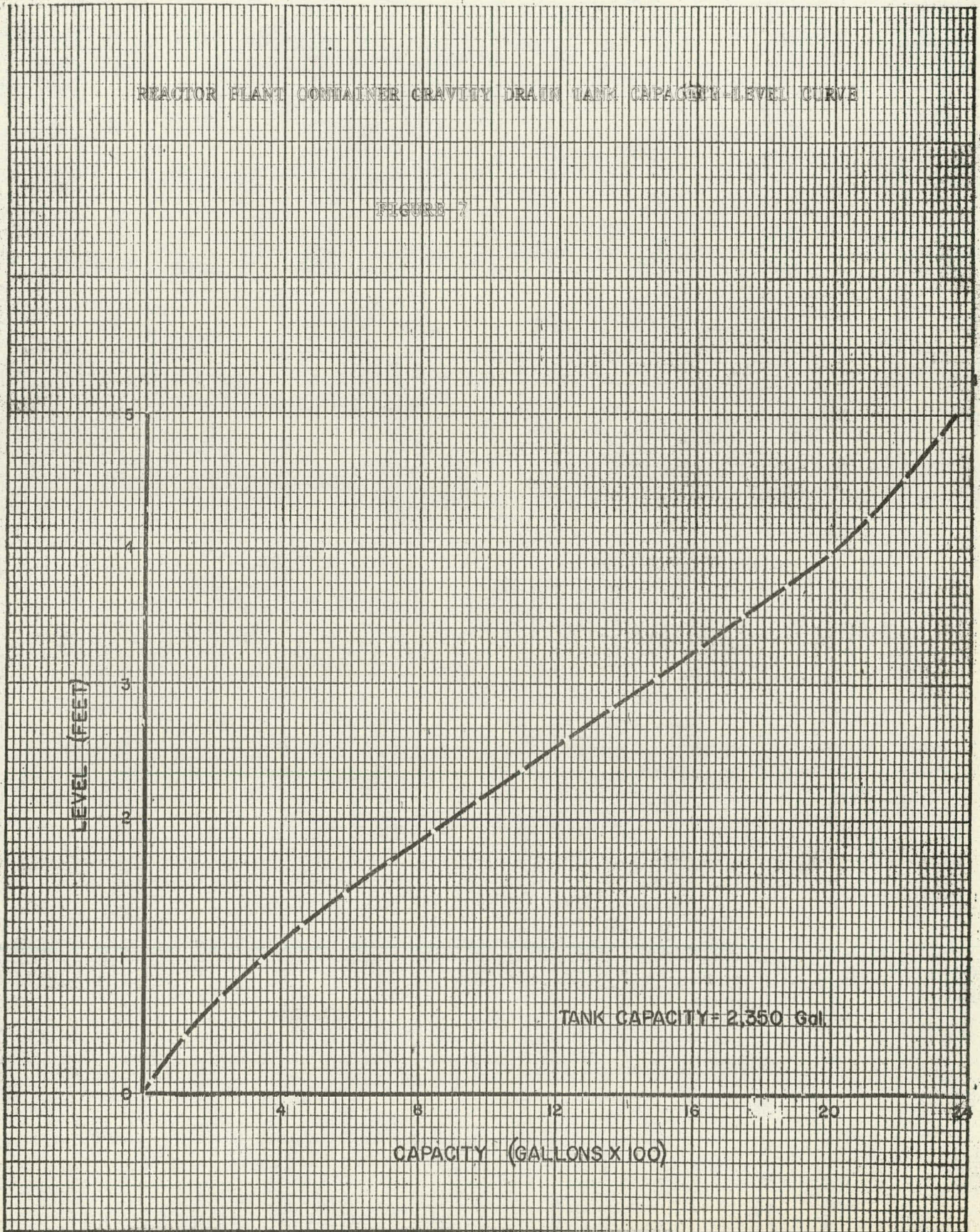
NOTE: Volume of liquid below D/P
Cell is disregarded in the
Curve below. This volume
is very small due to umbrella
type bottom head.



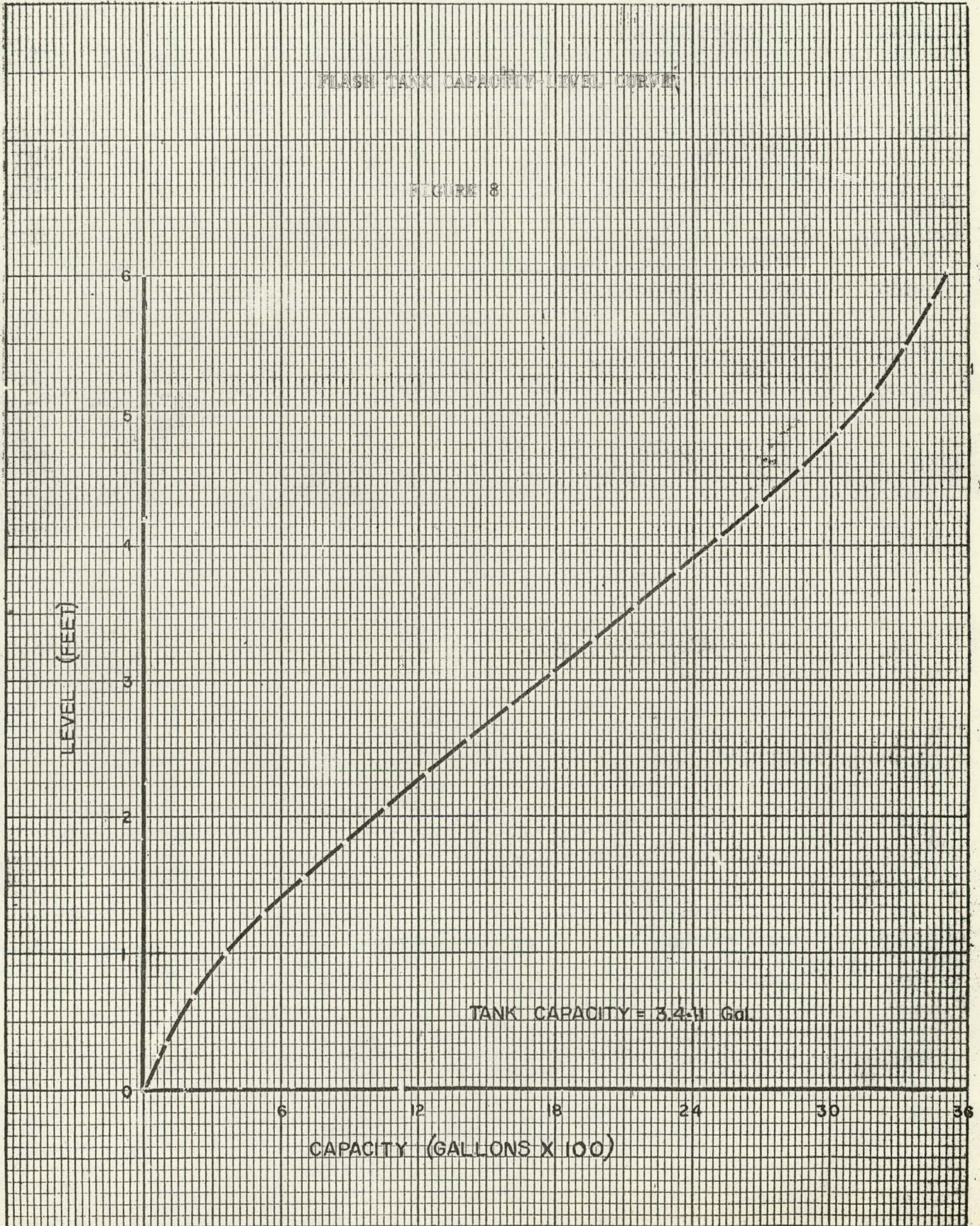


REACTOR PLANT CONTAINER GRAVITY DRAIN TANK CAPACITY-LEVEL CURVE

FIGURE 7



508 019



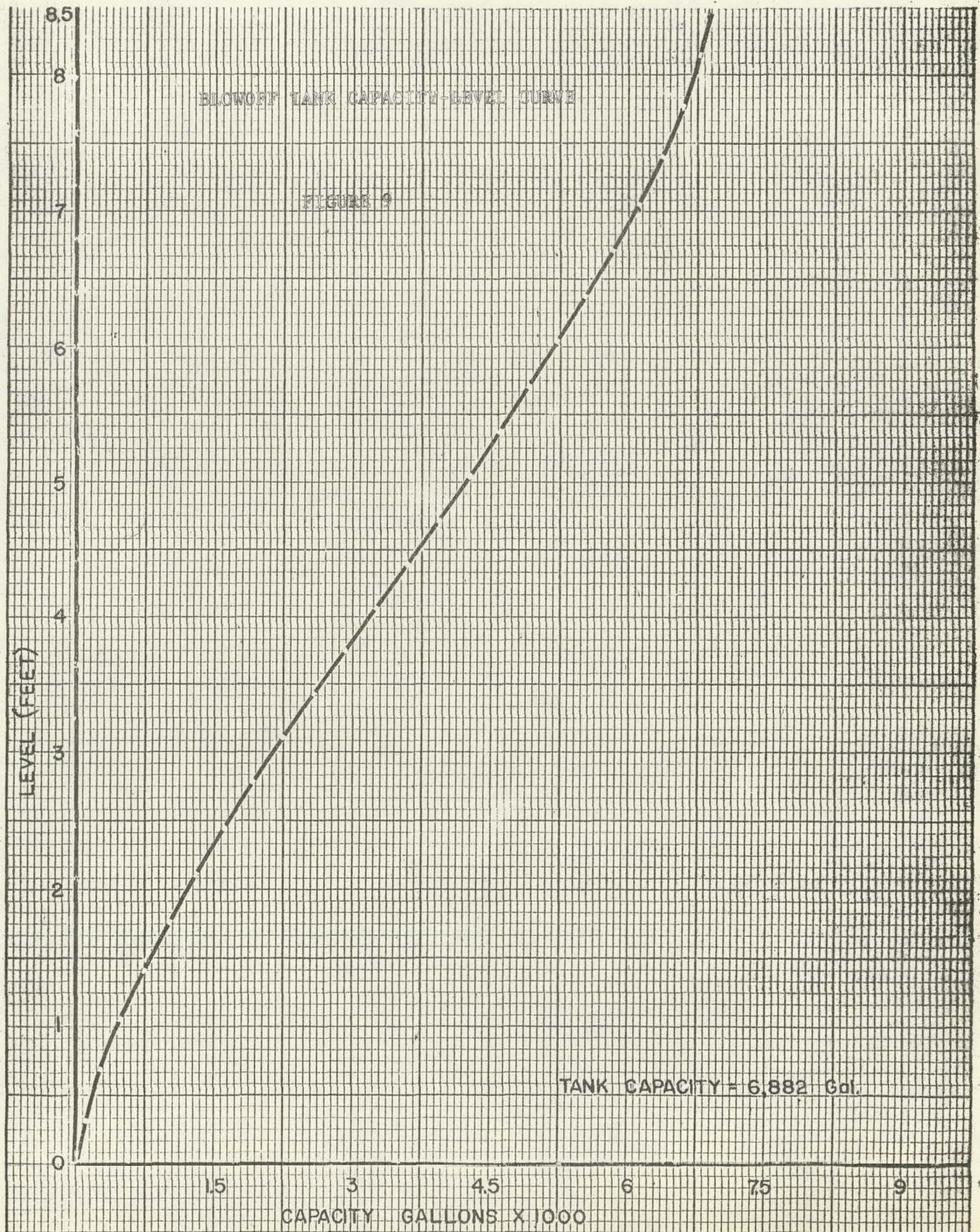


TABLE I

SUMMARY OF "A" (NON-ACTIVE) LIQUID WASTE
 DISCHARGED DURING REFUELING

Date	Volume Gal.	Activity $\mu\text{c/ml}$	Duration of Discharge		Activity In Eff. Channel $\mu\text{c/ml} \times 10^{-8}$	Total μc
			Hr.	Min.		
11/2/59	6000	1.30×10^{-6}	1	40	0.012	2.70
11/3/59	5750	1.20×10^{-7}	1	35	0.065	13.80
11/4/59	5700	6.40×10^{-7}	3	30	0.008	3.68
11/5/59	5700	1.704×10^{-7}	1	45	0.020	4.67
11/5/59	5900	1.97×10^{-8}	2	00	0.002	0.44
11/6/59	4100	8.81×10^{-7}	2	30	0.040	13.65
11/6-7/59	5950	7.34×10^{-7}	2	25	0.051	16.54
11/7-8/59	6000	3.77×10^{-7}	2	50	0.022	8.58
11/9/59	5000	3.00×10^{-7}	2	15	0.019	5.50
11/10/59	6050	1.10×10^{-7}	1	45	0.011	2.54
11/11/59	6050	6.80×10^{-7}	1	50	0.063	15.73
11/12/59	6000	1.03×10^{-7}	2	40	0.007	2.40
11/13/60	6000	1.26×10^{-6}	2	00	0.107	28.62
11/14/59	5750	3.60×10^{-7}	1	35	0.037	8.05
11/16/59	5450	3.00×10^{-7}	1	40	0.027	6.00
11/18/59	6050	9.70×10^{-6}	6	27	0.263	223.85
11/18/59	6000	1.15×10^{-6}	1	45	0.111	26.10
11/19/59	5450	1.464×10^{-6}	1	45	0.013	3.02
11/20/59	5750	1.57×10^{-6}	1	30	0.170	34.16
11/22/59	6050	3.79×10^{-7}	2	00	0.032	8.68
11/23/59	6000	5.44×10^{-7}	2	30	0.037	12.36
11/24/59	6050	4.60×10^{-7}	1	30	0.053	10.28
11/25/59	6050	5.30×10^{-7}	2	05	0.430	12.10
11/26/59	5500	1.20×10^{-6}	1	25	0.130	24.75
11/28/59	6050	3.87×10^{-6}	1	20	0.498	88.33
<u>Mo. Total</u>	<u>144350</u>		<u>54</u>	<u>17</u>		<u>576.53</u>
12/1/59	5700	7.98×10^{-7}	1	45	0.073	172.14
12/2/59	5700	5.62×10^{-6}	2	10	0.419	121.41
12/2/59	6050	2.70×10^{-5}	5	05	0.915	618.31
12/3/59	4840	2.448×10^{-5}	7	40	0.228	448.47
12/4/59	5650	2.21×10^{-5}	3	15	0.899	472.34
12/5/59	5750	4.11×10^{-5}	9	35	0.695	897.00
12/5/59	6750	1.00×10^{-5}	2	50	0.678	256.50
12/11/59	6000	1.97×10^{-5}	8	00	0.434	447.60
12/12/59	6050	6.60×10^{-6}	1	30	0.761	151.25

TABLE I (cont'd)

SUMMARY OF "A" (NON-ACTIVE) LIQUID WASTE
 DISCHARGED DURING REFUELING

Date	Volume Gal.	Activity $\mu\text{c/ml}$	Duration of Discharge		Activity In Eff. Channel $\mu\text{c/ml} \times 10^{-8}$	Total μc
			Hr.	Min.		
12/14-15/59	5250	1.89×10^{-6}	2	15	0.125	37.54
12/16/59	4850	2.61×10^{-6}	1	10	0.310	47.92
12/17/59	6000	5.05×10^{-6}	2	40	0.325	114.60
12/18-19/59	5400	1.58×10^{-6}	1	05	0.215	32.29
12/20/59	6000	2.13×10^{-6}	1	30	0.238	48.36
12/21/59	5500	3.20×10^{-6}	1	15	0.396	66.61
12/23-24/59	6000	3.46×10^{-5}	10	00	0.585	786.00
12/24/59	5750	2.70×10^{-6}	1	50	0.238	58.65
12/28-29/59	5550	3.10×10^{-6}	2	15	0.215	66.60
12/30/59	4750	1.33×10^{-6}	1	45	0.101	23.89
12/31/59	5750	2.76×10^{-6}	3	30	0.126	60.37
12/31-1/60	3900	2.31×10^{-6}	3	15	0.078	34.10
<u>Mo. Totals</u>	<u>117190</u>		<u>74</u>	<u>20</u>		<u>4961.95</u>
1/4/60	6750	1.69×10^{-6}	1	30	0.215	43.20
1/6/60	5600	8.80×10^{-7}	1	10	0.120	18.65
1/7/60	6050	2.70×10^{-6}	1	15	0.367	60.50
1/9/60	4700	2.71×10^{-6}	4	00	0.046	51.75
1/9/60	6050	2.60×10^{-6}	2	40	0.167	59.29
1/12/60	5500	8.62×10^{-7}	3	25	0.039	17.93
1/13/60	4800	5.90×10^{-7}	1	50	0.044	10.70
1/14/60	4750	4.20×10^{-6}	1	00	0.498	76.00
1/15-16/60	4500	4.90×10^{-5}	4	15	0.747	855.00
1/19/60	6050	2.16×10^{-6}	2	45	0.135	49.43
1/20/60	4580	2.18×10^{-6}	3	45	0.076	37.78
1/21/60	6100	1.67×10^{-6}	7	25	0.068	38.43
1/23/60	5600	3.40×10^{-6}	7	20	0.075	72.80
1/25/60	4750	1.86×10^{-6}	3	55	0.063	33.25
1/27/60	6050	1.39×10^{-6}	1	30	0.158	32.07
1/28/60	4450	1.56×10^{-6}	1	30	0.431	90.33
1/29/60	4290	6.96×10^{-7}	1	15	0.067	11.15
1/30	4950	8.80×10^{-7}	2	15	0.055	16.34
<u>Mo. Totals</u>	<u>95520</u>		<u>52</u>	<u>45</u>		<u>1574.60</u>
2/1/60	5500	7.90×10^{-7}	1	50	0.067	16.45
2/3/60	5500	7.78×10^{-7}	3	25	0.036	15.40
2/4/60	6000	4.72×10^{-7}	3	05	0.026	10.74
2/7/60	4500	4.68×10^{-7}	1	45	0.034	8.10

TABLE I (cont'd)

SUMMARY OF "A" (NON-ACTIVE) LIQUID WASTE
 DISCHARGE DURING REFUELING

Date	Volume Gal.	Activity $\mu\text{c/ml}$	Duration of Discharge		Activity In Eff. Channel $\mu\text{c/ml} \times 10^{-8}$	Total μc
			Nr.	Min.		
2/9/60	5250	6.43×10^{-7}	2	05	0.048	12.60
2/11/60	5700	8.29×10^{-7}	3	45	0.016	7.13
2/12/60	5825	9.11×10^{-7}	6	00	0.025	20.39
2/15/60	6050	8.42×10^{-7}	2	15	0.064	19.30
2/17/60	5460	5.05×10^{-7}	1	50	0.043	10.37
2/19/60	5600	5.25×10^{-8}	2	45	0.003	1.12
2/20/60	4600	1.10×10^{-7}	2	50	0.005	1.84
2/24/60	6050	7.79×10^{-7}	3	25	0.040	17.85
2/25/60	5000	3.66×10^{-7}	7	15	0.007	6.95
2/26/60	4950	1.78×10^{-7}	3	35	0.007	3.32
2/27/60	5950	4.70×10^{-7}	1	20	0.024	10.59
<u>2/29-3/1/60</u>	<u>6000</u>	<u>3.15×10^{-7}</u>	<u>2</u>	<u>40</u>	<u>0.020</u>	<u>7.14</u>
No. Total	87935		49	50		169.29
3/2/60	4850	3.17×10^{-7}	1	25	0.031	5.82
3/3/60	5900	1.22×10^{-6}	2	10	0.093	27.14
3/5/60	5500	6.72×10^{-7}	2	10	0.048	13.97
3/7/60	5620	1.39×10^{-7}	1	30	0.015	2.96
3/8-9/60	5550	4.79×10^{-7}	2	50	0.027	10.05
3/10/60	5750	2.81×10^{-5}	9	45	0.475	609.50
3/11/60	5700	1.24×10^{-6}	1	55	0.078	26.73
3/13/60	5700	4.37×10^{-7}	5	50	0.012	9.41
3/15/60	400	9.04×10^{-8}	0	05	0.006	0.14
<u>3/15/60</u>	<u>3850</u>	<u>9.04×10^{-8}</u>	<u>2</u>	<u>40</u>	<u>0.004</u>	<u>1.31</u>
No. Total	48820		39	20		707.03

TABLE II

SUMMARY OF SPECIAL LIQUID WASTE TANKS
 DISCHARGE DURING REFUELING

Date	Volume Gal.	Activity $\mu\text{c/ml}$	Duration of Activity In		Eff. Channel $\mu\text{c/ml} \times 10^{-8}$	Total μc	Type Tank Discharge
			Discharge Hr.	Min.			
11/2/59	3570	2.61×10^{-5}	3	10	0.840	352.72	Special Waste
11/2/59	3570	1.31×10^{-5}	6	35	0.200	177.07	Special Waste
11/3/59	3530	2.92×10^{-5}	3	55	0.742	390.06	Special Waste
11/5/59	3560	2.68×10^{-6}	3	45	0.073	36.10	Special Waste
11/6/59	3570	1.81×10^{-6}	2	45	0.046	24.45	Special Waste
11/7/59	3360	2.14×10^{-5}	3	15	0.616	271.82	Special Waste
11/8/59	3570	1.96×10^{-6}	3	05	0.063	26.49	Special Waste
11/9/59	3570	2.88×10^{-5}	5	40	0.487	389.13	Special Waste
11/10/59	3570	3.02×10^{-6}	2	55	0.102	40.69	Special Waste
11/13/59	3570	6.70×10^{-7}	2	45	0.023	9.05	Special Waste
11/14/59	3490	5.44×10^{-6}	2	45	0.184	71.89	Special Waste
11/14/59	3450	5.69×10^{-6}	3	10	0.174	74.31	Special Waste
11/14-15/59	3350	1.50×10^{-5}	3	15	0.432	190.95	Special Waste
11/16-17/59	3300	2.50×10^{-5}	2	30	0.848	313.50	Special Waste
11/18/59	3570	3.20×10^{-6}	3	15	0.098	42.84	Special Waste
11/19/59	3480	1.74×10^{-5}	4	35	0.383	229.33	Special Waste
11/20/59	3200	3.032×10^{-6}	3	10	0.087	36.80	Special Waste
11/20-21/59	3570	4.15×10^{-6}	3	45	0.113	56.05	Special Waste
11/21-22/59	3570	2.865×10^{-6}	4	10	0.068	38.70	Special Waste
11/22/59	3500	9.05×10^{-7}	3	55	0.023	11.99	Special Waste
11/23/59	3570	7.40×10^{-7}	3	00	0.025	9.99	Special Waste
11/25-26/59	3280	1.24×10^{-6}	2	25	0.042	15.38	Special Waste
11/26/59	3570	2.30×10^{-5}	2	55	0.779	310.59	Special Waste
11/27-28/59	3240	3.04×10^{-5}	6	15	0.464	372.92	Special Waste
11/28/59	3570	6.90×10^{-6}	3	30	0.199	92.82	Special Waste
11/29/59	3400	3.00×10^{-5}	4	20	0.661	385.00	Special Waste
11/30/59	3400	4.80×10^{-5}	7	25	0.653	612.00	Special Waste
Monthly Total	93950		102	10		4582.64	
12/1/59	3400	2.70×10^{-6}	4	35	0.055	33.32	Special Waste
12/2/59	3570	2.02×10^{-5}	4	40	0.445	272.96	Special Waste
12/3-4/59	2560	5.46×10^{-5}	10	10	0.194	529.15	Special Waste
12/4/59	940	5.46×10^{-5}	3	45	0.389	194.30	Special Waste
12/4-5/59	3300	3.70×10^{-5}	5	30	0.625	462.00	Special Waste
12/5-6/59	1500	1.29×10^{-4}	7	10	0.655	735.00	1B Chem. To Special Waste

TABLE II (cont'd)

SUMMARY OF SPECIAL LIQUID WASTE TANKS
 DISCHARGE DURING REFUELING

Date	Volume Gal.	Activity $\mu\text{c/ml}$	Duration of Activity In		Eff. Channel $\mu\text{c/ml} \times 10^{-8}$	Total μc	Type Tank Discharge
			Discharge Hr.	Min.			
12/6/59	3570	1.00×10^{-4}	12	05	0.847	1356.60	Special Waste
12/7/59	3570	5.50×10^{-5}	8	00	0.652	749.70	Special Waste
12/7-8/59	2270	2.75×10^{-4}	10	30	0.932	3712.80	Special Waste
12/9/59	3570	1.80×10^{-4}	9	35	0.915	2427.60	Special Waste
12/11-12/59	3570	1.306×10^{-4}	16	23	0.885	1764.65	Special Waste
12/15/59	350	7.90×10^{-5}	1	10	0.669	105.00	1D Surge
12/15/59	3570	6.40×10^{-5}	7	50	0.870	856.80	Special Waste
12/15/59	1560	7.90×10^{-5}	5	00	0.669	468.00	1D Surge
12/16/59	300	7.90×10^{-5}	1	00	0.669	90.00	1D Surge
12/16/59	800	7.90×10^{-5}	1	30	1.178	240.00	1D Surge
12/16/59	300	7.90×10^{-5}	1	05	0.669	90.00	1D Surge
12/16/59	1200	7.90×10^{-5}	3	55	0.669	360.00	1D Surge
12/17/59	450	7.90×10^{-5}	1	25	0.669	135.00	1D Surge
12/17/59	3350	1.197×10^{-4}	15	18	0.812	1517.89	Special Waste
12/18/59	800	7.90×10^{-5}	4	10	0.401	240.00	1D Surge
12/19/59	3400	4.75×10^{-5}	6	25	0.724	611.32	Special Waste
12/19-20/59	3570	1.09×10^{-4}	15	23	0.739	1474.41	Special Waste
12/20/59	1750	7.90×10^{-5}	4	25	0.885	525.00	1D Surge
12/21/59	1950	7.90×10^{-5}	6	30	0.669	585.00	1D Surge
12/23/59	3570	6.508×10^{-5}	8	15	0.772	879.29	Special Waste
12/29/59	5560	4.80×10^{-5}	15	14	0.488	1000.80	1D Surge
12/30/59	3125	2.68×10^{-5}	5	35	0.409	316.88	Special Waste
12/30/59	5560	4.80×10^{-5}	13	05	0.569	1000.80	1D Surge
12/31/59	300	4.80×10^{-5}	0	45	0.569	54.00	1D Surge
12/31/59	4500	4.80×10^{-5}	7	45	0.653	810.00	1D Surge
Monthly Total	77,785		218	08		23598.27	
1/1/60	2160	3.26×10^{-5}	4	30	0.443	266.54	Special Waste
1/2/60	900	4.80×10^{-5}	1	00	1.219	162.00	1D Surge
1/4	3570	5.40×10^{-5}	7	00	0.824	714.00	Special Waste
1/5-6/60	645	1.75×10^{-4}	3	35	0.889	427.25	Special Waste
1/6/60	1395	1.75×10^{-4}	7	45	0.889	924.05	Special Waste
1/6/60	4760	2.66×10^{-5}	4	00	0.902	480.76	1B Test
1/6-7/60	3400	1.266×10^{-4}	14	25	0.858	1629.28	Special Waste
1/7/60	5000	5.40×10^{-6}	4	10	0.183	100.00	1A Test
1/7-8/60	5000	1.05×10^{-6}	9	25	0.027	19.85	1B Test
1/8/60	3160	2.684×10^{-5}	4	50	0.409	321.06	Special Waste

TABLE II (cont'd)

SUMMARY OF SPECIAL LIQUID WASTE TANKS
 DISCHARGE DURING REFUELING

Date	Volume Gal.	Activity $\mu\text{c}/\text{ml}$	Duration of Activity In		Eff. Channel $\mu\text{c}/\text{ml} \times 10^{-8}$	Total μc	Type Tank Discharge
			Discharge Hr.	Min.			
1/8/60	5000	1.90×10^{-6}	3	30	0.077	36.00	1A Test
1/8-9/60	3570	1.10×10^{-4}	7	10	0.746	1486.37	Special Waste
1/9/60	3900	5.955×10^{-5}	4	10	0.807	879.06	1D Surge
1/10/60	2600	4.40×10^{-6}	2	25	0.134	44.20	1A Test
1/10/60	4750	2.50×10^{-5}	4	20	0.763	451.25	1B Test
1/10/60	480	5.955×10^{-5}	1	00	0.810	101.19	1D Surge
1/11/60	1640	5.955×10^{-5}	3	45	0.706	369.66	1D Surge
1/11/60	280	5.955×10^{-5}	0	35	0.810	63.11	1D Surge
1/15/60	1472	1.30×10^{-4}	6	08	0.441	721.28	1B Surge
1/15/60	3400	3.55×10^{-5}	6	45	0.483	456.96	Special Waste
1/16/60	1680	1.30×10^{-4}	7	00	0.441	823.20	1B Surge
1/17/60	940	1.30×10^{-4}	3	55	0.881	460.60	1B Surge
1/18/60	320	1.30×10^{-4}	1	20	0.881	156.80	1B Surges
1/18/60	3750	4.36×10^{-5}	6	15	0.737	618.75	Special Waste
1/19/60	160	1.30×10^{-4}	0	40	0.881	78.40	1B Surge
1/19/60	960	1.30×10^{-4}	4	00	0.881	470.40	1B Surge
1/20/60	820	1.30×10^{-4}	3	25	0.881	401.80	1B Surge
1/21/60	1440	1.30×10^{-4}	6	00	0.881	705.60	1B Surge
1/22/60	680	1.30×10^{-4}	2	50	0.881	333.20	1B Surge
1/22/60	2950	7.89×10^{-5}	7	25	0.936	882.05	Special Waste
1/23/60	500	1.30×10^{-4}	2	05	0.881	245.00	1B Surge
1/23/60	700	1.30×10^{-4}	3	15	0.881	343.00	1B Surge
1/24/60	1280	1.30×10^{-4}	5	20	0.881	627.20	1B Surge
1/25/60	1140	1.30×10^{-4}	4	45	0.881	558.60	1B Surge
1/25-26/60	2600	7.93×10^{-5}	5	20	0.638	780.52	Special Waste
1/26-27/60	3570	6.84×10^{-5}	12	50	0.579	924.27	Special Waste
1/27/60	1120	1.30×10^{-4}	4	40	0.881	548.80	1B Surge
1/27/60	180	1.30×10^{-4}	0	45	0.881	88.20	1B Surge
1/28/60	1320	1.30×10^{-4}	5	30	0.881	646.80	1B Surge
1/28/60	2580	2.88×10^{-5}	3	20	0.634	279.04	Special Waste
1/29/60	340	1.30×10^{-4}	1	25	0.881	166.60	1B Surge
1/29/60	280	1.30×10^{-4}	1	10	0.881	137.20	1B Surge
1/30/60	3570	3.297×10^{-5}	4	25	0.782	445.54	Special Waste
1/31/60	1020	1.30×10^{-4}	4	45	0.881	499.80	1B Surge
1/31/60	2920	2.68×10^{-5}	3	10	0.681	296.09	Special Waste
Monthly Total	93902		206	03		21171.33	

TABLE II (cont'd)

SUMMARY OF SPECIAL LIQUID WASTE TANKS
 DISCHARGE DURING REFUELING

Date	Volume Gal.	Activity $\mu\text{c/ml}$	Duration of Activity In		Rff. Channel $\mu\text{c/ml} \times 10^{-8}$	Total μc	Type Tank Discharge
			Discharge Nr.	Min.			
2/1/60	800	1.30×10^{-4}	3	20	0.881	392.00	1B Surge
2/2/60	3600	2.40×10^{-5}	3	25	0.732	326.88	Special Waste
2/2/60	5000	2.49×10^{-6}	3	50	0.093	47.10	1B Test
2/3/60	3560	2.29×10^{-5}	2	30	0.932	308.65	Special Waste
2/4-5/60	1800	1.06×10^{-4}	7	30	0.719	721.80	1D Surge
2/5/60	4300	8.94×10^{-6}	2	50	0.394	145.34	1B Test
2/6/60	3500	7.09×10^{-5}	8	15	0.841	939.05	1A Test
2/6/60	3600	2.03×10^{-5}	3	15	0.654	276.48	Special Waste
2/7/60	1460	1.06×10^{-4}	6	05	0.719	585.46	1D Surge
2/8/60	1560	1.06×10^{-4}	6	30	0.719	625.56	1D Surge
2/8/60	1500	1.39×10^{-4}	8	20	0.706	789.00	1B Test
2/8/60	3570	3.27×10^{-5}	3	20	0.997	441.97	Special Waste
2/9/60	1440	1.06×10^{-4}	6	00	0.719	577.44	1D Surge
2/9-10/60	2970	1.78×10^{-4}	10	55	1.356	2001.78	Special Waste
2/10/60	2380	1.06×10^{-4}	9	55	0.719	954.38	1D Surge
2/10/60	945	1.39×10^{-4}	5	15	0.706	497.07	1B Test
2/11/60	1480	1.06×10^{-4}	7	05	0.719	593.48	1D Surge
2/11-12/60	3550	6.42×10^{-5}	12	50	0.544	862.30	Special Waste
2/12/60	1560	1.06×10^{-4}	5	30	0.719	625.56	1D Surge
2/12/60	3640	9.64×10^{-6}	3	10	0.310	132.86	Special Waste
2/13/60	1340	1.06×10^{-4}	5	35	0.719	537.34	1D Surge
2/13/60	1335	1.39×10^{-4}	7	25	0.706	702.21	1B Test
2/13-14/60	3570	6.22×10^{-6}	8	30	0.738	840.38	Special Waste
2/14/60	1920	1.06×10^{-4}	8	00	0.719	769.92	1D Surge
2/14/60	615	1.39×10^{-4}	3	25	0.706	323.49	1B Test
2/16/60	3550	2.88×10^{-5}	4	20	0.683	386.95	Special Waste
2/17/60	3320	2.30×10^{-5}	5	30	0.389	288.84	Special Waste
2/20-21/60	3600	5.94×10^{-5}	16	00	0.403	810.00	Special Waste
2/23-24/60	3570	9.70×10^{-5}	10	00	0.987	1310.55	Special Waste
2/24/60	4850	3.86×10^{-5}	7	20	0.720	708.10	1A Test
2/24/60	3670	5.87×10^{-6}	3	15	0.189	81.47	Special Waste
2/25-26/60	3050	7.06×10^{-5}	7	10	0.837	814.96	Special Waste
2/27/60	3500	1.29×10^{-5}	3	50	0.378	170.80	Special Waste
2/27-28/60	3500	5.63×10^{-5}	5	10	1.041	745.85	1B Test
2/29/60	1438	1.52×10^{-4}	12	20	0.643	827.28	Special Waste
Monthly Total	95043		227	40		21162.30	

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE II (cont'd)

SUMMARY OF SPECIAL LIQUID WASTE TANKS
 DISCHARGE DURING REFUELING

Date	Volume Gal.	Activity $\mu\text{c/ml}$	Duration of Activity In		Eff. Channel $\mu\text{c/ml} \times 10^{-8}$	Total μc	Type Tank Discharge
			Discharge Hr.	Mfn.			
3/1/60	1850	1.52×10^{-4}	9	35	0.643	1064.31	Special Waste
3/2-3/60	3760	7.99×10^{-5}	11	40	0.677	1137.02	Special Waste
3/3-4/60	3400	1.02×10^{-4}	15	10	0.692	1312.74	Special Waste
3/4/60	3570	2.76×10^{-5}	4	00	0.701	373.07	Special Waste
3/5-6/60	3600	3.77×10^{-5}	15	15	0.256	514.80	Special Waste
3/6/60	5000	4.90×10^{-5}	10	30	0.666	927.50	1A Test
3/6-7/60	5000	9.19×10^{-5}	14	00	0.935	1739.00	1B Test
3/8/60	3600	6.70×10^{-6}	4	00	0.170	91.44	Special Waste
3/9/60	810	1.81×10^{-4}	6	45	0.614	554.93	Special Waste
3/10/60	120	1.81×10^{-4}	1	00	0.614	82.21	Special Waste
3/10-11/60	1450	1.81×10^{-4}	12	05	0.614	496.70	Special Waste
3/11/60	3570	1.02×10^{-5}	3	40	0.277	137.80	Special Waste
3/12/60	3770	2.84×10^{-5}	4	10	0.241	403.39	Special Waste
3/14/60	2886	6.23×10^{-5}	6	40	0.739	680.52	Special Waste
3/14-15/60	2050	1.28×10^{-4}	10	30	0.650	993.23	Special Waste
3/15-16/60	4400	2.86×10^{-5}	4	40	0.776	476.52	1B Test
<u>Monthly Total</u>	<u>48836</u>		<u>133</u>	<u>40</u>		<u>10985.18</u>	

TABLE III

SUMMARY OF REACTOR PLANT EFFLUENT DISCHARGE DURING REFUELING

	Volume Gal.	Activity $\mu\text{c/ml}$	Duration of Discharge		Activity In Eff. Channel $\mu\text{c/ml} \times 10^{-8}$	Total μc	H^3 $\mu\text{c/ml}$	H^3 Total	Type Tank Discharged
			Hr.	Min.					
11/5/59	2145	7.00×10^{-5}	5	30	0.771	368.43	5.7×10^{-2}	0.46	Surge and Decay
11/5/59	910	7.00×10^{-5}	2	20	0.771	241.15	5.7×10^{-2}	0.20	Surge and Decay
11/6/59	390	7.00×10^{-5}	1	00	0.771	103.35	5.7×10^{-2}	0.08	Surge and Decay
11/6/59	910	7.00×10^{-5}	2	20	0.771	241.15	5.7×10^{-2}	0.20	Surge and Decay
11/6/59	293	7.00×10^{-5}	0	45	0.771	77.65	5.7×10^{-2}	0.06	Surge and Decay
11/7/59	2730	7.00×10^{-5}	7	00	0.771	723.45	5.7×10^{-2}	0.59	Surge and Decay
11/8/59	3152	7.00×10^{-5}	8	05	0.771	835.28	5.7×10^{-2}	0.68	Surge and Decay
11/9/59	1950	7.00×10^{-5}	5	00	0.771	516.75	5.7×10^{-2}	0.42	Surge and Decay
11/10/59	2210	7.00×10^{-5}	5	40	0.771	585.65	5.7×10^{-2}	0.48	Surge and Decay
11/11/59	2633	7.00×10^{-5}	6	45	0.771	697.75	5.7×10^{-2}	0.57	Surge and Decay
11/12/59	2437	7.00×10^{-5}	6	15	0.771	645.81	5.7×10^{-2}	0.52	Surge and Decay
11/13/59	162	7.00×10^{-5}	0	25	0.771	42.93	5.7×10^{-2}	0.03	Surge and Decay
11/13/59	260	7.00×10^{-5}	0	40	0.771	68.90	5.7×10^{-2}	0.06	Surge and Decay
11/19/59	11601	2.78×10^{-7}	7	55	0.011	12.18	----	----	Canal Deep Pit
11/19/59	5236	1.77×10^{-7}	5	00	0.005	3.51	----	----	Fuel Storage Pit
11/25/59	4500	1.00×10^{-8}	2	00	0.001	0.18	----	----	Shroud Pit
11/25/59	5000	7.70×10^{-6}	3	50	0.274	145.70	0.43×10^{-2}	0.08	Test
11/27/59	5000	1.48×10^{-5}	3	45	0.502	280.00	0.43×10^{-2}	0.08	Test
11/29/59	130900	1.00×10^{-8}	4	30	0.008	5.23	----	----	Fuel Storage Pit
Mo. Total	182419		78	45		5795.05		4.51	
12/7/59	4750	2.86×10^{-6}	3	30	0.051	51.30	0.43×10^{-2}	0.08	Test
12/10/59	1200	1.00×10^{-8}	6	30	0.000	0.48	----	----	Canal Waters Demin.
12/10/59	4750	4.40×10^{-6}	4	05	0.142	80.75	0.43×10^{-2}	0.08	Test
12/11/59	2150	1.20×10^{-6}	1	15	0.059	30.10	0.43×10^{-2}	0.03	Test
12/14/59	4200	8.74×10^{-6}	3	55	0.267	13.90	0.43×10^{-2}	0.07	Test
	17050		19	15		176.53		0.26	

-29- 599 030

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE IV

CUMULATIVE TOTALS OF "A" (NON-ACTIVE) LIQUID WASTE
 TANKS DISCHARGED DURING REFUELING

Date Month	Total Volume Gallons	Total Activity Microcuries	Total Hours	Time Minutes
November	144350	576.53	54	17
December	261540	5538.48	128	37
January	357060	7113.08	181	22
February	444995	7282.37	231	12
March	493815	7989.40	261	32

NOTE: Design based on a yearly volume of 2,066,000 gallons containing a total activity of 7,300 microcuries.

TABLE V

CUMULATIVE TOTAL OF "B" (SPECIAL LIQUIDS) WASTE
 DISCHARGED DURING REFUELING

Date Month	Total Volume Gallons	Total Activity Microcuries	Total Hours	Time Minutes
November	93950	4582.64	102	10
December	171735	28180.91	320	18
January	265637	49352.24	526	21
February	360680	70514.54	754	01
March	409516	81499.172	887	41

NOTE: Design based on a yearly volume of 1,076,750 gallons containing a total activity of 408,800 microcuries.

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPENSBURG ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
DLCS 2390401
T-641317

TABLE VI

CUMULATIVE TOTAL OF REACTOR PLANT EFFLUENT
TANKS DISCHARGED DURING REFUELING

Date Month	Total Volume Gallons	Total Activity Microcuries	Total Tritium Curies	Total Hours	Time Minutes
November	182419	5795.05	4.51	78	45
December	199469	5971.58	4.77	98	00
January	-----	-----	----	--	--
February	-----	-----	----	--	--
March	-----	-----	----	--	--

NOTE: Design based on a yearly volume of 276,000 gallons containing a total activity of 47,450 microcuries and a tritium activity of 3650 curies for surge and decay tanks only.

TABLE VII

SUMMARY OF ACTIVITY DISCHARGED TO THE OHIO RIVER

A Comparison of Design Values With Core Refueling Values

Waste Tank	Daily Volume Gallons		Daily Activity				Percentages Actual/Design			Comments
	Design	Actual	Microcuries Design	Microcuries Actual	Tritium Curies Design	Tritium Curies Actual	Volumes	Activity	Tritium	
A	5630	3657.89	20.00	59.18	--	--	64.81	295.90	--	Actual based on 135 days
B	2950	3033.45	1120.00	603.70	--	--	102.83	53.90	--	Actual based on 135 days
Reactor Plant Effluent	750	4242.30	130.00	134.77	10.00	0.1111	561.03	103.67	1.111	Actual based on 43 days

509 033
-32-

TABLE VIII

COMPARISON OF ACTUAL TO DESIGN LIMITS OF TANKS
 DISCHARGED TO THE OHIO RIVER

Type Waste Tanks	Designed Daily Capacity Gallons	Designed Daily Capacity Gallons	Designed Daily Activity Microcuries	Actual Daily Activity Microcuries	Permissible Daily Maximum Activity Microcuries	Permissible Average Daily Activity Microcuries	Actual Maximum Daily Activity Microcuries	Actual Minimum Daily Activity Microcuries
Non-active liquid "A"	5630	3657.89	20.00	59.18	6200	1590	12/5/59 1153.50	2/19/60 1.12
Special liquid "B"	2950	3033.45	1120.00	603.70	6200	1590	2/10/60 2856.37	11/13/59 9.05
Reactor Plant Eff. Including Canal Water and Test Tanks	750	4242.30	130.00	134.77	6200	1590	11/8/59 835.28	11/25/59 0.18

Total Activity (135 days) - 95460.70 μ c
 Average Daily Activity - 707.12 μ c
 Per Cent Activity to Design Activity - 55.68 per cent

-33-
 509
 034

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
DLCS 2390401
T-641317

TABLE IX

COMPARISON OF MAXIMUM AND MINIMUM
OPERATING PRESSURES TO DESIGNED LIMITS

Vessel	Designed Operating Pressure psig	Maximum Operating Pressure psig	Minimum Operating Pressure psig
Vent Gas Surge Drum	100	52.2	12.1
Vent Gas Compressor Suction	15.5 psia	31.5 psia	12.8 psia
1A Gas Decay Drum	75	27.0	12.5
1B Gas Decay Drum	75	21.1	3.1
1C Gas Decay Drum	75	48.4	0.3
1D Gas Decay Drum	75	54.1	31.3
Blow-Off Tank	50	7.0	0.1
Reactor Plant	2000	60*	25

* Reactor pressure was 1000 psig on 3/13/60 which occurred during hydrostatic test of reactor.

TABLE X

GROSS BETA GAMMA ACTIVITY OF TANKS AND DRUMS

Tank Tested	Gross β Activity Prior to Refueling dpm/ml	Gross β Activity After Refueling dpm/ml	Comments
1A Surge	Not Sampled	490 \pm 6.7	
1B Surge	50 \pm 1.1	1844 \pm 12.9	
1C Surge	Not Sampled	2539 \pm 14.6	C Tank was receiving water while A, B and D tanks were isolated during sampling after refueling.
1D Surge	Not Sampled	1921 \pm 9.0	
1A Test	6.3 \pm 0.66	125 \pm 2.6	
1B Test	0.9 \pm 0.6	Not Sampled	
Spray Recycle	31 \pm 0.95	180 \pm 2.9	
Vent Gas	Xe ¹³³ - 260 dpm/cc	Xe ¹³³ - BKGD	
Surge	Kr ⁸⁵ - Not Detected	Kr ⁸⁵ - BKGD	
1A Gas Decay	BKGD	BKGD	
1B Gas Decay	BKGD	BKGD	
1C Gas Decay	BKGD	BKGD	
1D Gas Decay	BKGD	BKGD	
1A Chemical Waste	Not Sampled	83.4 \pm 2.1	A tank was receiving water during sampling after refueling
1B Chemical Waste	76 \pm 1.3	3256 \pm 11.8	
1A Special Waste	5.4 \pm 0.68	Not Sampled	
1B Special Waste	24.0 \pm 0.90	87 \pm 2.3	
1A Non-Active Waste	BKGD	1.4 \pm 0.7	
1B Non-Active Waste	BKGD	2.5 \pm 0.7	

- NOTES: 1. Tanks not sampled were either empty or were isolated from the system at sampling time.
 2. All counting statistics were obtained from NMC Gas Flow Proportional Counter.
 3. Dates of sampling: 11/2/59 and 3/18/60.

-35-
 709 - 036

DUQUESNE LIGHT COMPANY
 POWER STATIONS-DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XI (cont'd)

November, 1959

Date Time		13 1200	14 1200	15 1200	16 1200	17 1200	18 1200	19 1200	20 1200	21 1200	22 1200	23 1200
1A Surge and Decay Tank Level	%	18	18	20	19	18	18	18	19	19	20	19
1B Surge and Decay Tank Level	%	90	90	90	90	90	90	90	90	90	90	90
1C Surge and Decay Tank Level	%	12	12	14	14	14	14	14	18	26	26	26
1D Surge and Decay Tank Level	%	0	5	0	2	2	0	0	0	0	0	0
1A Test Tank Level	%	3	OOS	OOS	7	14	0	9	11	3	27	27
1B Test Tank Level	%	50	50	50	50	50	50	50	50	50	50	50
Spray Recycle Tank Level	%	75	74	75	74	75	76	75	75	75	75	75
RFC Gravity Drainage Tank Level	In.	36	39.5	42	42	43.5	46	46	47	49	49	49
**Flash Tank Level	In.	---	---	---	Data	---	---	---	14.0	---	---	16.7
**Blowoff Tank Level	In.	---	---	---	Discontinued	---	---	---	62	---	---	61
**Blowoff Tank Pressure	psig	---	---	---	---	---	---	---	---	---	---	0.6
1A Chemical Waste Tank Level	%	73	70	24	88	95	96	68	26	30	44	51
1B Chemical Waste Tank Level	%	69	70	80	33	27	41	52	79	85	85	85
1A Special Waste Tank Level	%	4	5	38	0	35	85	64	45*	88	20	87
1B Special Waste Tank Level	%	81	7	0	57	0	14	44	83	37*	81	10
1A Non-active Waste Tank Level	%	98	1	45	92	14	98	18	95	1	54	1
1B Non-active Waste Tank Level	%	39	95	0	25	100	0	90	9*	83*	0	52
Vent Gas Compressor Suction Press.		14.6	14.0	14.2	14.5	14.1	14.1	17.5	16.8	15.0	15.7	16.0
Vent Gas Surge Drum Pressure	psig	29.0	29.0	27.3	27.2	26.2	26.1	25.3	25.1	26.1	25.3	25.0
1A Gas Decay Drum Pressure	psig	18.2	18.2	17.3	18.0	17.6	18.0	17.9	17.8	18.0	18.0	17.9
1B Gas Decay Drum Pressure	psig	19.7	19.5	18.7	18.9	18.6	18.7	18.4	18.2	18.1	18.2	18.0
1C Gas Decay Drum Pressure	psig	31.5	30.2	28.0	27.9	26.2	26.3	24.9	23.9	23.3	22.6	21.6
1D Gas Decay Drum Pressure	psig	42.9	42.5	40.9	40.8	39.7	39.9	39.1	38.9	38.8	38.6	38.2
Ave. Coolant Temperature	F											
Reactor Pressure	psig	50	50	50	50	50	50	50	25	25		25

* Approximations

** Readings were taken at

-36-
599
037

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XI

November, 1959

Date Time		2 1200	3 1200	4 1200	5 1200	6 1200	7 1200	8 1200	9 1200	10 1200	11 1200	12 1200
1A Surge and Decay Tank Level	%	98	98	98	90	78	60	67	50	41	33	22
1B Surge and Decay Tank Level	%	90	90	100	90	90	90	90	90	90	90	90
1C Surge and Decay Tank Level	%	0	0	0	0	0	0	0	0	0	0	6
1D Surge and Decay Tank Level	%	7	0	5	10	9	6	0	0	0	0	0
1A Test Tank Level	%	79	75	77	79	77	78	76	75	41	10	1
1B Test Tank Level	%	30	30	32	50	50	50	50	50	50	0	50
Spray Recycle Tank Level	%	74	74	73	74	74	76	76	74	73	74	73
RPC Gravity Drainage Tank Level	In.	37.5	42	8	4.5	15	25	25	26.5	29	31.5	34.0
Flash Tank Level	In.	39	36	37	37.5	38.7	40.0	36	37.5	38.3	Data	
Blowoff Tank Level	In.	61.3	61.0	61.5	61.2	61.5	61.0	61.5	61.5	61.5	Discontinued	
Blowoff Tank Pressure	psig	2.0	1.8	1.75	1.7	1.4	1.2	1.2	1.09	1.09		
1A Chemical Waste Tank Level	%	38	11	11	28	32	33	35	48	54	64	85
1B Chemical Waste Tank Level	%	65	67	67	76	77	60	11	12	12	12	65
1A Special Waste Tank Level	%	13	84	0	35	0	86	0	51	71	0	85
1B Special Waste Tank Level	%	86	12	69	0	52	63	66	54	10	82	0
1A Non-active Waste Tank Level	%	4	83	30	97	100	5	14	80	18	100	100
1B Non-active Waste Tank Level	%	65	4	98	49	17	100	4	14	100	36	43
Vent Gas Compressor Suction Press.		15.5	16.5	14.5	13.5	13.0	13.0	15.5	17.5	20.0	21.0	14.8
Vent Gas Surge Drum Pressure	psig	23.3	22.1	18.7	25.0	21.2	18.0	16.8	14.2	12.1	29.2	28.8
1A Gas Decay Drum Pressure	psig	19.2	18.8	19.1	18.6	18.7	18.0	17.6	18.2	18.1	18.0	18.0
1B Gas Decay Drum Pressure	psig	21.1	20.9	21.0	20.8	20.6	20.0	19.7	20.0	19.8	19.8	19.4
1C Gas Decay Drum Pressure	psig	48.4	46.0	44.6	42.3	41.1	38.6	36.5	36.5	35.0	33.7	32.3
1D Gas Decay Drum Pressure	psig	50.3	51.9	54.1	54.0	52.0	49.5	47.0	46.0	45.0	44.0	43.2
Ave. Coolant Temperature	F	83	83	80	83	00S	----	----	----	----	----	----
Reactor Pressure	psig	50	50	50	50	00S	----	----	55	50	50	50

-37-
509 038

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XI (cont'd)

November, 1959

December, 1959

Date Time		24 1200	25 1200	26 1200	27 1200	28 1200	29 1200	30 1200	1 1200	2 1200	3 1200	4 1200
1A Surge and Decay Tank Level	%	20	20	21	21	22	22	22	21	21	21	21
1B Surge and Decay Tank Level	%	81	81	75	63	45	44	44	44	42	37	37
1C Surge and Decay Tank Level	%	26	26	31	31	31	31	31	34	34	34	34
1D Surge and Decay Tank Level	%	4	4	0	5	6	2	4	5	5	8	7
1A Test Tank Level	%	90	90	90	50	87	90	90	50	75	100	100
1B Test Tank Level	%	90	90	20	90	90	90	90	90	90	90	90
Spray Recycle Tank Level	%	74	75	75	75	75	75	75	73	73	76	73
RPC Gravity Drainage Tank Level	In.	51.5	51.5	52.5	52.5	55	1.5	5.0	8.0	16.0	18.4	20.0
*Flash Tank Level	In.	17.1	17.6	----	No Data Taken		-	----	33	33	33	33
*Blowoff Tank Level	In.	61	61	----	No Data Taken		-	----	61	61	61	61
*Blowoff Tank Pressure	psig	0.8	0.6	----	No Data Taken		-	----	0.3	0.3	0.3	0.3
1A Chemical Waste Tank	%	85	92	92	70	24	55	0	0	5	17	54
1B Chemical Waste Tank	%	85	86	12	17	20	52	72	76	76	76	76
1A Special Waste Tank	%	0	0	42	3	86	0	26	80	88	85	4
1B Special Waste Tank	%	63	78	37	77	28	79	67	76	31	77	78
1A Non-active Waste Tank	%	36	100	2	33	100	2	2	88	53	100	95
1B Non-active Waste Tank	%	6	36	90	0	0	23	65	0	100	100	70
Vent Gas Compressor Suction Press.		17.2	19.0	19.1	17.7	15.0	13.0	12.8	15.5	15.0	15.6	15.7
Vent Gas Surge Drum Pressure	psig	24.7	23.7	22.1	20.4	19.1	30.2	29.8	29.5	25.0	23.7	17.0
1A Gas Decay Drum Pressure	psig	18.2	17.8	17.4	17.5	17.3	17.3	17.1	17.1	17.1	17.0	17.1
1B Gas Decay Drum Pressure	psig	18.1	17.7	17.1	17.2	17.0	16.9	16.3	16.1	16.0	15.9	15.8
1C Gas Decay Drum Pressure	psig	21.2	19.9	18.9	18.5	17.6	17.0	16.2	15.7	15.0	14.3	14.1
1D Gas Decay Drum Pressure	psig	38.3	37.3	36.9	36.8	36.1	35.7	35.2	35.0	35.0	34.5	34.2
Reactor Pressure	psig	25	25	25	40	40	40	40	40	40	40	40

* Readings were taken at

1600 1600

0900 0800 0800 0800

38-

509

039

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XI (cont'd)

December, 1959

Date Time		5 1200	6 1200	7 1200	8 1200	9 1200	10 1200	11 1200	12 1200	13 1200	14 1200	15 1200
1A Surge and Decay Tank Level	%	21	21	22	21	22	22	22	22	2	21	16
1B Surge and Decay Tank Level	%	37	37	37	37	37	37	0	0	0	0	0
1C Surge and Decay Tank Level	%	34	34	34	34	34	34	34	42	43	48	008
1D Surge and Decay Tank Level	%	8	10	12	17	41	54	63	68	87	85	86
1A Test Tank Level	%	100	100	50	0	0	0	80	80	100	0	0
1B Test Tank Level	%	90	90	90	90	90	0	90	90	100	100	20
Spray Recycle Tank Level	%	75	73	73	73	72	72	71	70	70	70	75
RPC Gravith Drainage Tank Level	In.	22	24	24	24	27.5	30.5	30	30	29.5	28	28
*Flash Tank Level	In.	----	----	43	43	43	43	43	Inst.	Indicator	Incorrect	
*Blowoff Tank Level	In.	----	----	61	61	61	61	61	----	----	60	60
*Blowoff Tank Pressure	psig	----	----	0.6	0.3	0.3	0.2	0.3	----	----	0.2	0.2
1A Chemical Waste Tank	%	63	65	84	70	75	75	75	31	14	16	31
1B Chemical Waste Tank	%	76	25	73	95	95	84	84	84	84	84	84
1A Special Waste Tank	%	63	34	36	72	3	37	11	87	34	10	36
1B Special Waste Tank	%	0	76	26	87	62	66	90	9	33	67	60
1A Non-active Waste Tank	%	0	90	61	69	55	14	80	0	1	4	77
1B Non-active Waste Tank	%	62	100	71	56	40	94	0	25	45	85	0
Vent Gas Compressor Suction Press.		15.7	14.5	14.2	13.5	14.5	13.5	14.5	14.0	13.5	14.0	14.0
Vent Gas Surge Drum Pressure	psig	23.4	14.0	24.2	23.3	28.1	31.0	28.4	31.1	33.0	32.3	31.4
1A Gas Decay Drum Pressure	psig	17.5	17.8	17.6	17.3	17.1	27.0	16.9	17.7	17.3	16.4	16.7
1B Gas Decay Drum Pressure	psig	16.0	16.3	16.0	15.5	15.2	15.0	14.8	15.3	15.0	13.8	13.8
1C Gas Decay Drum Pressure	psig	14.0	13.9	13.0	12.2	11.7	11.1	10.3	10.9	10.1	9.0	8.6
1D Gas Decay Drum Pressure	psig	34.5	34.5	33.8	33.2	32.8	32.7	32.1	33.0	32.3	31.6	31.3
Reactor Pressure	psig	40	40	40	40	40	40	40	25	25	25	40

* Readings were taken at 1800 1800 1600 1600 1600 1300 1300 1300 1300

39-509
 040

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XI (cont'd)

December, 1959

Date Time		16 1200	17 1200	18 1200	19 1200	20 1200	21 1200	22 1200	23 1200	24 1200	25 1200	26 1200
1A Surge and Decay Tank Level	%	6	6	0	6	6	4	3	6	6	10	13
1B Surge and Decay Tank Level	%	0	0	4	00S	00S	00S	0	0	0	3	5
1C Surge and Decay Tank Level	%	00S	51	53	64	70	80	83	83	85	93	93
1D Surge and Decay Tank Level	%	73	65	62	57	55	43.5	54	48	50	51	54
1A Test Tank Level	%	0	0	0	0	0	0	0	0	0	0	0
1B Test Tank Level	%	30	30	30	30	30	30	30	30	30	30	30
Spray Recycle Tank Level	%	75	75	75	75	75	75	74	74	74	75	71
RPC Gravity Drainage Tank Level	In.	46.5	49.5	51	43	49	27	37	37	43.5	44.5	44.5
Flash Tank Level	In.	Ind.	Incorr.	14	----	----	----	----	----	----	----	----
Blowoff Tank Level	In.	60	60	60	----	----	----	----	----	----	----	----
Blowoff Tank Pressure	psig	0.2	0.2	0.2	----	----	----	----	----	----	----	----
1A Chemical Waste Tank Level	%	38	47	55	68	82	82	84	83	84	85	85
1B Chemical Waste Tank Level	%	84	84	70	47	52.5	53	10	31	35	37	39
1A Special Waste Tank	%	78	39	2	86	0	11	19	39	84	10	19
1B Special Waste Tank	%	1	31	83	3	48	86	61	59	5	10	9
1A Non-active Waste Tank	%	1	26	88	2	17	88	2	29	95	1	1
1B Non-active Waste Tank	%	58	100	1	67	100	0	54	100	7	37	44
Vent Gas Compressor Suction Press.		13.5	14.0	14.4	14.8	14.3	13.6	14.0	14.3	13.7	14.5	13.8
Vent Gas Surge Drum Pressure	Pt. 1	28.8	27.0	26.6	25.7	24.3	20.9	21.8	21.3	21.0	22.8	22.9
1A Gas Decay Drum Pressure	Pt. 2	17.3	17.2	17.3	17.0	17.0	17.0	16.9	16.8	16.7	16.6	16.7
1B Gas Decay Drum Pressure	Pt. 3	14.2	13.9	14.0	13.5	13.4	13.3	13.2	13.0	12.7	12.7	12.7
1C Gas Decay Drum Pressure	Pt. 4	9.0	8.4	8.2	7.5	7.4	7.3	6.8	6.8	6.3	6.0	5.8
1D Gas Decay Drum Pressure	Pt. 5	32.1	32.2	32.2	31.7	32.0	32.2	32.0	32.0	32.0	32.1	32.2
Reactor Pressure	psig	40	25	40	25	25	25	25	20	25	25	25

-40-
509 041

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 23904C1
 T-641317

TABLE XI (cont'd)

December, 1959

January, 1960

Date Time		27 1200	28 1200	29 1200	30 1200	31 1200	1 1200	2 1200	3 1200	4 1200	5 1200	6 1200
1A Surge and Decay Tank Level	%	10	12	12	11	10	10	10	10	9	9	9
1B Surge and Decay Tank Level	%	22	25	35	42	50	51	50	59	62	62	62
1C Surge and Decay Tank Level	%	94	82	87	76	76	76	76	75	75	72	52
1D Surge and Decay Tank Level	%	62	63	59	40	21	7	5	9	1	45	40
1A Test Tank Level	%	0	0	0	0	0	0	0	----	0	0	100
1B Test Tank Level	%	30	30	30	30	30	30	30	----	30	40	85
Spray Recycle Tank Level	%	61	68	64	62	60	58	57	55	54	87	87
RPC Gravity Drainage Tank Level	In.	44.5	46.0	46	29	30.5	31.5	32.5	32.5	32.5	36.0	41.0
*Flash Tank Level	In.	----	36	36	36	----	----	----	----	35	35	35
*Blowoff Tank Level	In.	----	60	60	60	----	----	----	----	59	59	59
*Blowoff Tank Pressure	psig	----	0.2	0.2	0.1	----	----	----	----	0	0	0
1A Chemical Waste Tank Level	%	11	11	11	10	41	47	49	50	57	64	77
1B Chemical Waste Tank Level	%	39	47	60	75	75	76	76	76	76	46	45
1A Special Waste Tank	%	54	82	10	85	10	16	31	64	70	50	18
1B Special Waste Tank	%	0	0	65	0	40	2	3	0	25	58	75
1A Non-active Waste Tank	%	1	1	72	2	62	2	3	2	3	72	2
1B Non-active Waste Tank	%	51	78	0	53	35	30	32	40	75	3	55
Vent Gas Compressor Suction Press.		13.8	13.8	13.5	14.0	13.5	14.0	13.5	13.2	14.0	13.5	14.5
Vent Gas Surge Drum Pressure	Pt. 1	25.0	25.0	26.3	22.2	20.0	17.5	17.5	18.2	17.7	24.0	21.5
1A Gas Decay Drum Pressure	Pt. 2	16.3	16.0	16.8	16.3	16.5	16.3	15.3	15.8	15.6	15.5	15.5
1B Gas Decay Drum Pressure	Pt. 3	12.4	12.0	12.5	12.2	12.0	11.6	11.6	11.2	10.8	10.7	10.6
1C Gas Decay Drum Pressure	Pt. 4	5.3	4.9	5.5	5.0	4.7	4.6	4.5	3.8	3.4	3.2	3.4
1D Gas Decay Drum Pressure	Pt. 5	31.9	31.6	32.3	31.9	31.8	31.9	32.0	31.5	31.3	31.7	31.7
Reactor Pressure	psig	25	25	40	40	40	40	40	40	40	40	40

* Readings were taken at

1300 1300 1300

1300

41-509 0A2

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XI (cont'd)

January, 1960

Date Time		7 1200	8 1200	9 1200	10 1200	11 1200	12 1200	13 1200	14 1200	15 1200	16 1200	17 1200
1A Surge and Decay Tank Level	%	10	10	10	11	4	5	9	9	11	4	3
1B Surge and Decay Tank Level	%	62	64	66	80	81	90	100	100	----	96	85
1C Surge and Decay Tank Level	%	42	22	14	1	14	25	26	37	40	46	60
1D Surge and Decay Tank Level	%	40	39	30	30	25	14	8	7	7	4	4
1A Test Tank Level	%	80	96	0	0	0	20	36	35	35	34	34
1B Test Tank Level	%	80	11	90	98	20	97	94	97	98	98	95
Spray Recycle Tank Level	%	86	85	84	83	83	83	82	83	81	80	79
RPC Gravity Drainage Tank Level	In.	42.5	43.5	45.0	46.0	46.0	46.0	47.0	9.5	15.5	18.5	18.5
Flash Tank Level	In.	35	35	-----	-----	35	35	35	34.9	34.9	34.9	-----
Blowoff Tank Level	In.	59	59	-----	-----	59.2	59.3	59.3	59.2	59.2	59.2	-----
Blowoff Tank Pressure	psig	0	0	-----	-----	0	0	0	0	0	0	-----
1A Chemical Waste Tank Level	%	81	82	83	10	10	10	11	11	18	21	20
1B Chemical Waste Tank Level	%	46	11	23	34	38	46	60	72	81	61	10
1A Special Waste Tank	%	0	86	0	32	66	0	0	39	79	26	59
1B Special Waste Tank	%	67	4	55	85	3	29	75	6	36	29	1
1A Non-active Waste Tank	%	6	69	3	50	73	2	3	71	2	53	80
1B Non-active Waste Tank	%	100	0	100	3	3	38	0	9	70	0	0
Vent Gas Compressor Suction Press.		14.0	14.2	13.8	14.5	14.0	14.0	14.2	13.7	14.2	13.7	13.3
Vent Gas Surge Drum Pressure	Pt. 1	23.8	20.6	17.4	27.3	30.2	30.2	30.3	29.2	24.4	23.8	23.2
1A Gas Decay Drum Pressure	Pt. 2	15.5	15.6	15.2	15.3	15.4	15.3	15.5	15.5	15.7	15.2	15.0
1B Gas Decay Drum Pressure	Pt. 3	10.6	10.6	10.2	10.2	10.0	10.2	10.2	10.2	10.2	9.9	9.6
1C Gas Decay Drum Pressure	Pt. 4	3.4	3.2	3.0	2.8	2.9	2.8	3.2	3.1	3.2	2.8	2.6
1D Gas Decay Drum Pressure	Pt. 5	31.6	31.8	31.6	31.7	31.8	31.7	32.2	32.3	32.3	32.0	32.0
Reactor Pressure	psig	40	50	50	50	50	50	50	50	50	50	50

-42-

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DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XI (cont'd)

January, 1960

Date Time		18 1200	19 1200	20 1200	21 1200	22 1200	23 1200	24 1200	25 1200	26 1200	27 1200	28 1200
1A Surge and Decay Tank Level	%	9	12	11	11	12	11	12	12	12	12	11
1B Surge and Decay Tank Level	%	----	79	73	62	56	51	39	29	25	28	24
1C Surge and Decay Tank Level	%	60	62	65	87	89	94	94	94	94	75	77
1D Surge and Decay Tank Level	%	4	3	2	0	0	0	4	35	45	47	57
1A Test Tank Level	%	34	34	34	33	30	27	25	48	88	89	93
1B Test Tank Level	%	96	96	96	84	75	71	67	58	59	91	100
Spray Recycle Tank Level	%	77	78	77	77	75	74	74	74	73	71	71
RPC Gravity Drainage Tank Level	In.	22.0	----	----	7	26.5	38	46.5	1	23	25.5	37
* Flash Tank Level	In.	34.2	44.5	44.4	44.4	44.5	44.5	----	44.3	44.3	44.3	44.5
*Blowoff Tank Level	In.	59.2	59.2	59.2	59.2	59.4	59.5	----	59.2	59.2	59.3	59.5
*Blowoff Tank Pressure	psig	0	0	0	0	0	0	----	0.5	0.5	0.5	0.5
1A Chemical Waste Tank Level	%	50	45	41	35	25	25	11	4	1	1	1
1B Chemical Waste Tank Level	%	0	1	8	10	20	27	27	28	37	43	47
1A Special Waste Tank Level	%	86	0	7	64	0	8	43	46	81	0	56
1B Special Waste Tank Level	%	0	35	76	12	45	13	14	49	4	72	19
1A Non-active Waste Tank Level	%	100	3	60	100	3	50	76	3	8	67	2
1B Non-active Waste Tank Level	%	10	66	10	27	82	3	3	40	100	0	66
Vent Gas Compressor Suction Press.		13.2	13.9	14.2	14.2	13.5	13.9	14.4	13.9	13.9	13.9	13.9
Vent Gas Surge Drum Pressure	Pt. 1	23.3	22.7	21.3	23.1	22.2	22.1	20.9	25.4	25.0	25.2	24.7
1A Gas Decay Drum Pressure	Pt. 2	15.2	15.3	15.2	15.0	14.8	14.8	15.0	15.0	14.9	14.9	14.8
1B Gas Decay Drum Pressure	Pt. 3	9.8	9.7	9.4	9.1	8.9	8.9	9.0	8.9	8.8	8.7	8.6
1C Gas Decay Drum Pressure	Pt. 4	2.8	2.5	2.4	2.0	1.9	2.1	2.2	2.0	2.0	2.0	1.9
1D Gas Decay Drum Pressure	Pt. 5	32.3	31.9	31.8	31.7	31.6	31.9	32.1	32.1	32.3	32.4	32.4
Reactor Pressure	psig	50	50	50	50	50	50	50	50	40	40	40

* Readings were taken at

1300 1300 1400 1400 1400 1300

43-

599 044

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XI (cont'd)

January, 1960

February, 1960

Date \ Time		29 1200	30 1200	31 1200	1 1200	2 1200	3 1200	4 1200	5 1200	6 1200	7 1200	8 1200
1A Surge and Decay Tank Level	%	11	13	10	11	16	21	25	30	45	51	58
1B Surge and Decay Tank Level	%	16	18	13	6	2	0	0	0	10	8	5
1C Surge and Decay Tank Level	%	70	53	37	15	78	80	68	91	83	79	80
1D Surge and Decay Tank Level	%	72	79	88	89	88	90	90	66	72	60	52
1A Test Tank Level	%	4	5	17	17	90	85	74	78	24	6	3
1B Test Tank Level	%	100	100	98	97	94	0	92	82	70	100	85
Spray Recycle Tank Level	%	70	71	70	70	70	70	69	68	68	68	68
RPC Gravity Drainage Tank Level	In.	43.0	37.0	8.0	22.0	26	31.5	36	45	52	25.5	26.5
*Flash Tank Level	In.	44.5	44.5	----	44.5	44.5	44.5	44.5	44.5	44.5	----	44.5
*Blowoff Tank Level	In.	59.5	59.5	----	59.5	59.5	59.5	59.5	59.5	59.5	----	59.5
*Blowoff Tank Pressure	psig	0.5	0.5	----	0.5	0.5	0.5	0.5	0.6	0.7	----	0.6
1A Chemical Waste Tank Level	%	1	1	1	1	0	12	42	71	95	95	95
1B Chemical Waste Tank Level	%	52	53	53	55	62	62	43	32	0	0	0
1A Special Waste Tank Level	%	20	85	0	43	4	0	56	74	35	60	84
1B Special Waste Tank Level	%	67	12	39	4	22	81	5	33	86	0	0
1A Non-active Waste Tank Level	%	77	4	4	28	87	19	20	24	72	5	5
1B Non-active Waste Tank Level	%	3	64	89	3	0	65	50	0	6	26	51
Vent Gas Compressor Suction Press.		----	13.8	13.8	13.8	15.0	31.0	14.8	16.1	14.8	18.2	19.0
Vent Gas Surge Drum Pressure	Pt. 1	25.0	27.0	27.5	26.3	24.6	30.1	27.4	23.1	23.3	18.3	14.8
1A Gas Decay Drum Pressure	Pt. 2	14.8	14.5	14.5	14.1	13.4	14.4	15.5	14.6	14.6	15.1	15.2
1B Gas Decay Drum Pressure	Pt. 3	8.6	8.3	8.2	7.8	7.0	8.0	9.1	8.1	8.7	8.9	8.6
1C Gas Decay Drum Pressure	Pt. 4	1.9	1.6	1.6	1.7	.4	1.4	2.6	1.6	2.1	2.1	2.0
1D Gas Decay Drum Pressure	Pt. 5	32.3	32.2	32.3	32.1	31.4	32.5	34.0	33.1	33.7	33.8	33.8
Reactor Pressure	psig	40	50	50	50	50	50	50	50	50	40	40

* Readings were taken at 2000 2000 1300 1300 1300 1300 1300 1300 1300

44-509 045

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XI (cont'd)

February, 1960

Date Time		9 1200	10 1200	11 1200	12 1200	13 1200	14 1200	15 1200	16 1200	17 1200	18 1200	19 1200
1A Surge and Decay Tank Level	%	59	45	66	70	79	82	84	86	97	97	96
1B Surge and Decay Tank Level	%	10	12	18	15	12	11	12	17	23	28	41
1C Surge and Decay Tank Level	%	77	74	73	73	69	60	60	57	51	48	47
1D Surge and Decay Tank Level	%	48	46	35	24	17	4	4	4	5	7	5
1A Test Tank Level	%	22	18	18	16	33	94	95	93	93	93	90
1B Test Tank Level	%	82	55	43	39	33	13	3	22	71	92	89
Spray Recycle Tank Level	%	71	70	73	72	71	72	69	68	67	67	74
RPC Gravity Drainage Tank Level	In.	31	38.5	1	15	21	29	34	51	36.5	38.5	38
*Flash Tank Level	In.	44.5	44.3	44.4	44.5	44.5	----	44.3	35.5	35.5	35.5	35.5
*Blowoff Tank Level	In.	59.5	59.5	59.5	59.5	59.5	----	59.5	59.5	59.5	59.5	59.5
*Blowoff Tank Pressure	psig	0.6	0.7	0.7	0.6	0.4	----	0.4	0.4	0.5	0.6	0.6
1A Chemical Waste Tank Level	%	95	96	96	75	62	49	43	40	40	46	52
1B Chemical Waste Tank Level	%	7	14	26	56	69	73	78	85	88	73	52
1A Special Waste Tank Level	%	0	46	83	4	86	0	0	33	80	0	43
1B Special Waste Tank Level	%	66	0	19	77	0	25	57	57	22	77	10
1A Non-active Waste Tank Level	%	20	80	5	18	58	84	100	5	20	72	5
1B Non-active Waste Tank Level	%	86	12	67	96	3	3	0	60	90	0	66
Vent Gas Compressor Suction Press.		29.9	14.5	15.0	14.0	14.8	15.0	14.0	14.5	14.5	15.5	15.0
Vent Gas Surge Drum Pressure	Pt. 1	30.7	29.3	25.0	21.0	18.0	30.3	26.9	26.3	27.9	26.7	23.9
1A Gas Decay Drum Pressure	Pt. 2	15.0	15.0	14.9	14.9	14.8	15.0	14.0	14.3	14.1	14.4	14.8
1B Gas Decay Drum Pressure	Pt. 3	8.5	8.4	8.2	8.2	8.0	7.0	5.0	5.0	4.7	4.4	4.7
1C Gas Decay Drum Pressure	Pt. 4	1.9	1.6	1.5	1.7	1.3	1.7	0.7	0.7	0.8	0.9	1.3
1D Gas Decay Drum Pressure	Pt. 5	33.6	33.6	33.3	33.6	33.6	33.8	32.8	33.0	32.8	33.0	33.8
Reactor Pressure	psig	40	40	40	40	40	40	50	50	40	40	40
* Readings were taken at		1300	1300	1300	1300	1300		1300	1300	1300	1300	1300

45-

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DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 23904C1
 T-641317

TABLE XI (cont'd)

February, 1960

March, 1960

Date		20	21	22	23	24	25	26	27	28	29	1	2	3	
Time		1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	
1A Surge and Decay Tank Level	%	95	96	OOS	94	94	94	78	67	71	63	95	99	99	
1B Surge and Decay Tank Level	%	48	51	57	60	61	64	93	88	88	90	75	70	74	
1C Surge and Decay Tank Level	%	47	48	46	48	48	48	48	47	34	30	20	21	13	
1D Surge and Decay Tank Level	%	3	3	5	4	5	8	9	7	10	20	17	29	42	
1A Test Tank Level	%	90	92	93	92	55	7	8	9	39	32	96	95	92	
1B Test Tank Level	%	88	85	92	65	67	72	75	69	0	0	0	0	31	
Spray Recycle Tank Level	%	Indicator out of service					---	---	---	---	---	---	---	---	---
RPC Gravity Drainage Tank Level	In.	29	10	10	11	15	29.5	43	48	57	30	44	52	6.5	
*Flash Tank Level	In.	----	----	----	35.5	35.5	36.5	----	----	----	37.1	38.3	38.3	39.5	
*Blowoff Tank Level	In.	----	----	----	59.5	59.5	59.5	----	----	----	60.0	60.0	60.0	60.0	
*Blowoff Tank Pressure	psig	----	----	----	0.4	0.4	0.6	----	----	----	2.2	2.1	2.1	2.5	
1A Chemical Waste Tank Level	%	65	67	67	74	79	79	20	80	88	88	89	77	58	
1B Chemical Waste Tank Level	%	28	26	10	10	10	14	24	30	37	60	84	84	76	
1A Special Waste Tank Level	%	86	0	0	12	87	0	51	83	0	25	30	90	27	
1B Special Waste Tank Level	%	25	70	80	84	0	65	79	16	67	44	3	7	59	
1A Non-active Waste Tank Level	%	27	62	71	100	3	80	5	46	76	100	5	72	5	
1B Non-active Waste Tank Level	%	75	0	5	14	78	0	80	98	0	7	78	0	61	
Vent Gas Compressor Suction Press.		17.1	14.0	17.5	31.5	27.0	17.0	19.0	14.5	14.5	19.0	19.5	26.5	14.5	
Vent Gas Surge Drum Pressure	Pt. 1	20.8	20.0	19.8	43.8	42.5	48.2	52.2	36.3	33.0	32.1	41.9	34.2	37.9	
1A Gas Decay Drum Pressure	Pt. 2	13.7	14.3	14.0	14.3	14.3	14.1	14.4	14.0	14.0	14.5	13.5	13.6	14.7	
1B Gas Decay Drum Pressure	Pt. 3	3.6	4.2	4.1	4.1	4.1	4.1	4.3	4.0	3.9	4.3	3.5	3.7	4.7	
1C Gas Decay Drum Pressure	Pt. 4	0.3	1.0	0.8	1.0	1.0	1.0	1.2	36.0	35.5	35.1	35.5	25.2	24.2	
1D Gas Decay Drum Pressure	Pt. 5	32.8	33.8	33.5	33.8	33.9	33.9	34.0	34.1	34.5	35.2	35.4	38.8	41.7	
Reactor Pressure	psig	25	50	25	40	40	40	40	50	50	50	50	50	40	

* Readings were taken at

1300 1300 1300

1300 1300 1300 1300

-46-
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DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XI (cont'd)

March, 1960

Date Time		4 1200	5 1200	6 1200	7 1200	8 1200	9 1200	10 1200	11 1200	12 1200	13 1200	14 1200	15 1200
1A Surge and Decay Tank Level	%	99	99	100	100	100	100	95	71	56	41	28	OOS
1B Surge and Decay Tank Level	%	73	72	72	71	72	72	74	71	72	71	72	71
1C Surge and Decay Tank Level	%	7	3	3	3	3	3	3	3	3	4	3	4
1D Surge and Decay Tank Level	%	44	49	59	58	49	47	47	46	50	45	87	85
1A Test Tank Level	%	91	90	39	10	78	36	35	35	34	32	33	34
1B Test Tank Level	%	OOS	Tk. Full	OOS	OOS	OOS	OOS	OOS	OOS	90	0	0	87
Spray Recycle Tank Level	%	OOS	OOS	OOS	OOS	OOS	OOS	OOS	OOS	OOS	OOS	OOS	OOS
RPC Gravity Drain Tank Level	In.	16	27	29	39	48	50	30	42	50.5	59	52	54
*Flash Tank Level	In.	35.5	37.0	----	36.3	36.5	42.5	35.5	38.5	19.0	----	21.0	26.0
*Blowoff Tank Level	In.	60.0	60.0	----	60.0	60.0	60.0	60.0	60.0	60.0	----	61.0	61.5
*Blowoff Tank Pressure	psig	2.4	2.4	----	4.8	6.4	6.6	6.6	6.4	6.5	----	7.0	7.0
1A Chemical Waste Tank Level	%	14	14	17	18	29	33	46	72	72	72	72	50
1B Chemical Waste Tank Level	%	73	49	26	26	26	35	44	28	38	49	66	68
1A Special Waste Tank Level	%	14	13	25	44	13	3	47	85	38	72	51	42
1B Special Waste Tank Level	%	47	87	6	4	13	54	22	55	88	5	11	6
1A Non-active Waste Tank Level	%	9	61	88	94	11	70	79	24	80	92	5	53
1B Non-active Waste Tank Level	%	90	0	3	26	91	0	54	94	0	25	68	62
Vent Gas Compressor Suction Press.		15.0	18.5	14.3	14.0	15.0							
Vent Gas Surge Drum Pressure	Pt. 1	35.8	29.9	30.5	29.7	26.4	25.4	26.7	25.4	25.5	21.9	21.5	28.2
1A Gas Decay Drum Pressure	Pt. 2	13.3	13.5	14.0	14.1	13.2	14.1	14.5	13.2	14.0	14.3	12.7	12.5
1B Gas Decay Drum Pressure	Pt. 3	3.5	3.8	4.4	4.5	3.6	4.6	4.9	3.8	4.5	4.8	3.3	3.1
1C Gas Decay Drum Pressure	Pt. 4	20.9	19.5	18.9	18.0	16.3	16.5	16.3	14.6	15.0	14.5	12.5	12.5
1D Gas Decay Drum Pressure	Pt. 5	41.3	42.0	43.0	43.3	42.3	43.1	43.4	42.0	42.7	42.6	40.9	40.6
Reactor Pressure	psig	50	50	50	50	40	40	25	40	60	1000	25	40
* Readings were taken at		1300	1300		1300	1300	1300	1300	1300	1300		1300	1300

-47-

FOG 048

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
DLCS 2390401
T-641317

TABLE XII

SUMMARY OF LOG OF EVENTS THROUGHOUT TEST

1. An entire new seed (32 seed assemblies), 1 new blanket assembly (F-2), and 2 rebuilt blanket assemblies (E-6, H-3) were installed by means of a wet refueling method. No difficulties were encountered which appreciably delayed the operation.
2. The volume discharged, activity and chromate concentration were not determined when the RPC Gravity Drain Tank was discharged.
3. No resin was discharged from the RP Demineralizers.
4. The volumes and flow rates were not determined when tanks were discharged to the effluent channel.
5. No gas decay drums were discharged to the atmosphere.
6. The Blow-off Tank was not vented to the atmosphere.
7. The volumes and flow rates were not determined when Surge Tanks and Chemical Waste Tanks were processed.
8. The weight and contact activity of material charged into the incinerator were not determined.
9. It was impossible to obtain a good approximation of contaminated non-combustible material handled.
10. The coolant sample trains were out of service.
11. The volume, gross β - γ activity, and flow rate was not determined when liquid was transferred from one tank to another.
12. No data could be obtained concerning Service Bldg. Laundry discharges and approximations are impossible.
13. The gross activity of the canal water demineralizers was not determined on a daily basis for the entire period of refueling.

TABLE XIII

LOG FOR REACTOR PLANT GRAVITY DRAINAGE TANK

12/30/59	0000 - 0800	Pumped 28.5 inches of water from GDT to B-Surge.
1/14/60	0145 - 0310	1B - RPC Gravity Drain Tank Discharge Pump in service.
1/21/60	0130 - 0330	GDT to 1C Surge
1/25/60	0215 - 0345	GDT to 1D Surge
1/26/60	1715	Pumped RPC Drain Tank to 20"
1/30/60	2300 - 2320	Discharged GDT to 1A Surge
2/6/60	1330	Pumped out RPC Gr. Drain Tank 25"
2/11/60	1000	Pumped out RPC Gr. Drain Tank 25"
2/17/60	1255	Pumped RPC Drain Tk. from 60" to 35"
2/20/60	0645	Pumped RPC Drain Tk. down to 29"
2/21/60	0145	Pumped RPC Drain Tk. down to 10"
2/29/60	0040	Pumped RPC Drain Tk. down to 30" Contents discharged to 1B Chemical.
3/3/60		Pumped RPC Drain Tk. to 1D Surge - Tk. empty
3/9/60		Pumped RPC Drain Tk. from 59" to 30"
3/10/60	2210	Pumped RPC Drain Tk. down to 29"
3/13/60	1410	Pumped RPC Drain Tk. to 1D Surge (put 5 per cent in) Pumped RPC Drain Tk. to 1 Chemical (put 6 per cent in) and level now 50".

GDT = gravity drain tank

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XIV

LOG OF TANKS DISCHARGED TO RIVER

Date	Time		Flow Rate	Permit No.
11/2/59	0205 - 0515	1A Special Waste		717
	0920 - 1100	1A Non-Active		718
	1245 - 1920	1B Special		719
11/3/59	0905 - 1040	1B Non-Active	80 gpm	720
	1300 - 1655	1A Special	10 gpm	721
11/4/59	0240 - 0610	1A Non-Active		723
11/5/59	0100 - 0245	1B Non-Active	80 gpm	724
	0300 - 0830	1A Surge and Decay		722
	0835 - 1220	1B Special Waste		726
	1315 - 1515	1A Non-Active		727
	1840 - 2055	1A Surge 91% to 87%		722
11/6/59	0230 - 0340	1A Surge and Decay 87% to 85%	6.5 gpm	722
	0340 - 0610	1B Non-Active Waste	80 gpm	728
	0610 - 0830	1A Surge and Decay 85%	6.5 gpm	722
	0830 - 1115	1A Special	20 gpm	729
	1600 - 1650	1A Surge and Decay to 74%		722
11/6-7/59	2250 - 0115	1A Non-Active		725
11/7/59	0230 - 0930	A Surge and Decay 74% to 62%	6.5 gpm	722
	1115 - 1430	B Special	20 gpm	730
11/7-8/59	2140 - 0030	B Non-Active	80 gpm	731
11/8/59	0050 - 0400	A Special	20 gpm	732
	1100 - 1905	A Surge and Decay 69% to 58%		722
11/9/59	0100 - 0600	A Surge and Decay 58% to 50%		722
	1040 - 1600	B Special	10 gpm	733
	1900 - 2115	A Non-Active		734

DUQUENNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XIV (cont'd)

LOG OF TANKS DISCHARGED TO RIVER

Date	Time		Flow Rate	Permit No.
11/10/59	0125 - 0705	A Surge and Decay 50% to 41%		722
	1150 - 1445	A Special		735
	1730 - 1915	B Non-Active		736
11/11/59	0030 - 0715	A Surge and Decay 41% to 33%		722
	2110 - 2300	A Non-Active		737
11/12/59	0015 - 0615	A Surge and Decay 33% to 20%		722
	1400 - 1640	B Non-Active	80 gpm	741
11/13/59	0015 - 0035	A Surge and Decay 20% to 18%		722
	0050 - 0335	A Special (3,570 gals.)	20 gpm	740
	0340 - 0420	A Surge and Decay (empty but gage still shows 18%)		722
	1330 - 1530	A Non-Active		742
11/14/59	0115 - 0400	B Special	20 gpm	743
	0905 - 1215	A Special		744
	2100 - 2235	B Non-Active		745
11/14-15/59	2245 - 0200	B Special		746
11/16/59	1900 - 2040	A Non-Active		747
	2150 - 0020	B Special		749
11/18/59	0043 - 0710	B Non-Active		750
	1500 - 1815	A Special	20 gpm	751
	2000 - 2145	A Non-Active		752
11/19/59	1015 - 1450	B Special		753
	2100 - 2245	B Non-Active		756
11/20/59	0001 - 0310	A Special (3,200 gals)		757
	1830 - 2000	A Non-Active		759
11/20-21/59	2050 - 0035	B Special	20 gpm	758

BUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XIV (cont'd)

LOG OF TANKS DISCHARGED TO RIVER

Date	Time		Flow Rate	Permit No.
11/21-22/59	2135 - 0145	A Special	20 gpm	760
11/22/59	0200 - 0400	B Non-Active		762
	1920 - 2315	B Special	20 gpm	763
11/23/59	0400 - 0600	A Non-Active		764
	1315 - 1615	A Special		765
11/24/59	1015 - 1145	B Non-Active		768
11/25/59	1425 - 1630	A Non-Active		770
	1730 - 2120	B Test	20 gpm	767
	2130 - 2400	B Special	20 gpm	771
11/26/59	1025 - 1320	A Special		772
	1550 - 1715	B Non-Active	80 gpm	773
11/27/59	0925 - 1310	A Test		766
11/27-28/59	1845 - 0100	B Special		775
11/28/59	1345 - 1715	A Special	20 gpm	776
	2200 - 2320	A Non-Active	80 gpm	778
11/29/59	1340 - 1800	B Special		780
11/30/59	1045 - 1810	B Special		781
12/1/59	0905 - 1050	B Non-Active		782
	1255 - 1730	A Special		783
12/2/59	0355 - 0605	A Non-Active	80 gpm	784
	0920 - 1400	B Special		785
	1555 - 2100	B Non-Active		786
12/3/59	1410 - 2150	A Non-Active		788
	2150 - 1145	A Special		787
12/4/59	1110 - 1505	B Non-Active		790
12/4-5/59	1930 - 0100	B Special		791

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XIV (cont'd)

LOG OF TANKS DISCHARGED TO RIVER

Date	Time		Flow Rate	Permit No.
12/5/59	0200 - 1135	A Non-Active (5750 gal)	10 gpm	792
12/5-6/59	1900 - 0210	B Chemical		793
12/6/59	0220 - 1425	A Special	5 gpm	794
	1430 - 1720	B Non-Active	40 gpm	795
12/7/59	0200 - 1000	B Special		797
	1005 - 1340	A Test Tank		777
12/9/59	0340 - 1315	A Special		801
12/10/59	0855	B Test Tank		774
12/11/59	0120	B Non-Active		805
12/11-12/59	1522 - 0745	B Special	40 gpm	806
12/12/59	0900 - 1030	A Non-Active	80 gpm	809
12/14/59	0800 - 1215	A Test Tank		808
	1215	B Test Tank		807
12/14-15/59	2310 - 0115	B Non-Active	80 gpm	811
12/15/59	0900 - 1010	1D Surge Tank		812
	1010 - 1805	B Special		813
	1810	1D Surge Tank	5 gpm	812
12/16/59	2005 - 0105	1D Surge Tank		812
	0110 - 0220	1A Non-Active	80 gpm	814
	0230 - 0400	1D Surge Tank		812
	2005 - 2110	1D Surge Tank	5 gpm	812
12/17/59	0001 - 0125	1D Surge Tank		812
	0130 - 1600	1A Special	4 gpm	816
	1650 - 1930	1B Non-Active	80 gpm	817
12/18/59	0950 - 1400	1D Surge Tank		812
12/18-19/59	2355 - 0100	1A Non-Active		818

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DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XIV (cont'd)

LOG OF TANKS DISCHARGED TO RIVER

Date	Time		Flow Rate	Permit No.
12/19/59	0105 - 0730	1B Special		819
12/19-20/59	2037 - 1200	1A Special	4 gpm	820
12/20/59	1310 - 1735	1D Surge		812
	1915 - 2045	1B Non-Active		821
12/21/59	0830 - 1500	1D Surge		812
12/22/59	0240 - 0355	1A Non-Active	80 gpm	823
12/23/59	0930 - 1745	1B Special		824
	1800 - 2400	1B Non-Active	10 gpm	825
12/24/59	2400 - 0910	1B Non-Active		825
	2200 - 2350	1A Non-Active		827
12/28-29/59	2230 - 0045	1B Non-Active		832
	0845 - 2400	1D Surge	10 gpm	831
12/30/59	0210 - 0355	1A Non-Active	80 gpm	834
	0400 - 0935	1B Special Waste	10 gpm	833
	0940 - 2245	1D Surge (25%)		831
12/31/59	0948 - 1030	1D Surge		831
	1030 - 1400	1B Non-Active	80 gpm	836
	1400 - 2145	1D Surge		831
12/31-1/1/60	2145 - 0100	1A Non-Active	80 gpm	837
	0200 - 0630	1B Special Waste	10 gpm	838
1/2/60	0100 - 0200	1D Surge		831
1/4/60	1045 - 1735	1A Special		839
	2115 - 2245	1B Non-Active	80 gpm	841
1/5/60	2225	1A Special	3 gpm	844

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XIV (cont'd)

LOG OF TANKS DISCHARGED TO RIVER

Date	Time		Flow Rate	Permit No.
1/6/60	0200	1A Special		844
	0200 - 310	1A Non-Active		845
	0315 - 0950	1A Special		844
	1110 - 1510	1B Test (10%)		846
	2045	1B Special		849
1/7/60	1110	1B Special		849
	1120 - 1530	1A Test		847
	1530 - 1645	1B Non-Active		850
	2020	1B Test	20 gpm	851
1/8/60	0210	1B Test		851
	0215 - 0705	1B Special		852
	1545 - 1915	1A Test	20 gpm	853
	1920	1A Special	10 gpm	854
1/9/60	0230	1A Special	10 gpm	854
	0230 - 0630	1A Non-Active		855
	0900 - 1310	1D Surge		848
	1550 - 1830	1B Non-Active		857
1/10/60	0925 - 1150	1A Test		859
	1245 - 1705	1B Test		856
	1730 - 1830	1D Surge		848
1/11/60	0250 - 0635	1D Surge (20% to 5%)		848
	0810 - 0845	1D Surge		848
1/12/60	0550 - 0915	1A Non-Active		861
1/13/60	0910 - 1100	1B Non-Active		864
1/14/60	2145 - 2245	1A Non-Active		866
1/15/60	0237 - 0845	1B Surge		867
	1025 - 1710	1A Special	10 gpm	868
	2215	1B Non-Active	20 gpm	869
	0230	1B Non-Active	20 gpm	869

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XIV (cont'd)

LOG OF TANKS DISCHARGED TO RIVER

Date	Time		Flow Rate	Permit No.
1/16/60	0900 - 1600	1B Surge (92%)	4 gpm	867
1/17/60	0350 - 0745	1B Surge (90% to 85%)		867
1/18/60	0010 - 1330	1B Surge		867
	1730 - 2345	1A Special		872
1/19/60	0020 - 0305	1A Non-Active	80 gpm	871
	0415 - 0455	1B Surge (5%)		867
	0615 - 1015	1B Surge (5%)		867
1/20/60	0040 - 0405	1B Surge		867
	0915	1B Non-Active		874
1/21/60	0010 - 0610	1B Surge		867
	1245 - 1700	1A Non-Active		876
1/22/60	0040 - 0330	B Surge		867
	0335 - 1100	A Special		877
1/23/60	0025 - 0230	B Surge		867
	1845 - 2200	B Surge (5%)		867
1/24/60	0040 - 0600	B Surge		867
1/25/60	0001 - 0400	A Non-Active		880
	0430 - 0915	B Surge		867
1/25-26/60	1850 - 0010	B Special		882
1/26-27/60	1640 - 0530	A Special	5 gpm	884
1/27/60	0530 - 0700	1B Non-Active		883
	1340 - 1830	B Surge		867
	2100 - 2145	B Surge (25%)		867
1/28/60	0430 - 0600	1A Non-Active	80 gpm	886
	1025 - 1555	1B Surge		867
	1710 - 2030	1A Special	20 gpm	889

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XIV (cont'd)

LOG OF TANKS DISCHARGED TO RIVER

Date	Time		Flow Rate	Permit No.
1/29/60	0100 - 0225	1B Surge		867
	0230 - 0345	1B Non-Active		867
	0350 - 0500	1B Surge (15%)		867
1/30/60	0630 - 0845	1A Non-Active		891
	1620 - 2045	1A Special	15 gpm	892
1/31/60	1015 - 1500	1B Surge		867
	1820 - 2130	1B Special	20 gpm	893
2/1/60	0515 - 0705	1B Non-Active		894
	1030 - 1350	1B Surge		867
2/2/60	0900 - 1225	1A Special		895
	1405 - 1755	1B Test		862
2/3/60	0820 - 1145	1A Non-Active		897
	1845 - 2015	1B Special		898
2/4/60	1120 - 1425	1B Non-Active	80 gpm	900
2/4-5/60	1800 - 0130	1D Surge		899
2/5/60	1825 - 2115	1B Test Tank	20 gpm	902
2/6/60	0645 - 1500	1A Test Tank	7 gpm	903
	1505	1B Special	20 gpm	904
2/7/60	0125 - 0310	1A Non-Active		906
	0320 - 0925	1D Surge		899
2/8/60	0045 - 0650	1D Surge		899
	0955 - 1815	1B Test Tank	3 gpm	905
	1815 - 2125	1A Special		907
2/9/60	0130 - 0730	1D Surge		899
	1600 - 1805	1B Non-Active	80 gpm	908
2/9-10/60	2045 - 0740	1B Special	5 gpm	909
2/10/60	0745 - 1740	1D Surge		899
	1830 - 2345	1B Test	3 gpm	905

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XIV (cont'd)

LOG OF TANKS DISCHARGED TO RIVER

Date	Time		Flow Rate	Permit No.
2/11/60	0135 - 0520	1A Non-Active	80 gpm	910
	0530 - 1235	1D Surge		899
2/11-12/60	1240 - 0130	1A Special	7 gpm	911
2/12/60	0150 - 0720	1D Surge		899
	1345 - 1945	1B Non-Active	80 gpm	912
2/13/60	0055 - 0540	1D Surge		899
	1120 - 1845	1B Test	3 gpm	905
2/13-14/60	1845 - 0315	1A Special	9 gpm	914
2/14/60	0315 - 1115	1D Surge		899
	1120 - 1445	1B Test		905
2/15/60	1810 - 2015	1A Non-Active	80 gpm	915
2/16/60	1100 - 1520	1B Special		916
2/17/60	1201 - 1730	1A Special		918
	1735 - 1925	1B Non-Active		917
2/19/60	0945 - 1230	1A Non-Active		920
2/20/60	1340 - 1625	1B Non-Active		924
	2/20-21/60	1630 - 0830	1A Special	8 gpm
2/23-24/60	0900 - 0300	1B Special	5 gpm	926
2/24/60	0305 - 0630	1A Non-Active	80 gpm	927
	0840 - 1605	1A Test	15 gpm	921
	1620 - 1935	1A Special	20 gpm	928
2/25/60	0015 - 0730	1B Non-Active		929
2/25-26/60	2000 - 0310	1B Special	8 gpm	930
2/26/60	0315 - 0650	1A Non-Active	80 gpm	931

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XIV (cont'd)

LOG OF TANKS DISCHARGED TO RIVER

Date	Time		Flow Rate	Permit No.
2/27/60	1755 - 1915	1B Non-Active		933
	1925 - 2315	1A Special		934
2/27-28/60	2320 - 0430	1B Test		922
2/29/60	0930 - 2150	1B Special	3 gpm	936
2/29-3/1/60	2150 - 0030	1A Non-Active		937
3/1/60	0035 - 1005	1B Special		936
3/2/60	0845 - 1000	1B Non-Active		939
3/2-3/60	1350 - 0130	1A Special		940
3/3/60	1105 - 1315	1A Non-Active		941
3/3-4/60	1320 - 0430	1B Special	4 gpm	942
3/4/60	0915 - 1300	1A Special	20 gpm	943
3/5/60	0905 - 1115	1B Non-Active	80 gpm	944
3/5-6/60	1130 - 0245	1B Special	12 gpm	948
3/6/60	0410 - 1440	1A Test	10 gpm	946
3/6-7/60	1615 - 0615	1B Test		947
3/7/60	1645 - 1815	1A Non-Active		949
3/8/60	0900 - 1300	1A Special		950
3/8-9/60	2210 - 0100	1B Non-Active	80 gpm	951
3/9/60	1330 - 2015	1B Special		953
3/10/60	1000 - 1100	1B Special	3 gpm	953
	1100 - 2045	1A Non-Active	17 gpm	954
3/10-11/60	2050 - 0855	1B Special	3 gpm	953
3/11/60	1250 - 1450	1B Non-Active	80 gpm	955
	1455 - 1835	1A Special	20 gpm	956

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
DLCS 2390401
T-641317

TABLE XIV (cont'd)

LOG OF TANKS DISCHARGED TO RIVER

Date	Time		Flow Rate	Permit No.
3/12/60	1330 - 1740	1B Special	16 gpm	957
3/13/60	1725 - 2315	1A Non-Active	80 gpm	959
3/14/60	0900 - 1540	1A Special	8 gpm	960
3/14-15/60	2045 - 0715	1B Special	3 gpm	962
3/15/60	1820 - 2100	1B Non-Active		961
	2105	1B Test		963

509 061

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
DLCS 2390401
T-641317

TABLE XV

LOG OF INCINERATOR OPERATION

11/2/59	0110 2030	Filled incinerator with trash Added paper to incinerator
11/3/59	0945 1430	Operating incinerator Removed ashes from incinerator and reloaded with trash
11/5/59	1000	Operating incinerator for DL-S-169, Section II
11/6/59	0630	Filled incinerator with trash
11/11/59	0945	Operating incinerator
11/25/59	1045	Operating incinerator
11/26/59	1110	Started burning trash in incinerator
11/27/59	1000	Started burning trash in the incinerator
11/28/59	0830	Started burning trash in the incinerator
11/29/59	0900	Started burning trash in the incinerator
12/22/59	1630	Started burning trash in the incinerator
12/23/59	0230	Started burning trash in the incinerator
12/27/59	1600	Started fire in incinerator
12/29/59	1700	Started burning trash in the incinerator
12/30/59	1030	Loaded incinerator
1/6/60	1525 2230	Started burning trash in the incinerator Cleaned out incinerator
1/7/60	1445 2330	Started burning trash in the incinerator Fire still in incinerator could not empty
1/8/60	0850 1930	Started burning trash in the incinerator Cleaned out incinerator

TABLE XV (cont'd)

LOG OF INCINERATOR OPERATION

1/9/60	0830 1615	Started burning trash in the incinerator Cleaned incinerator
1/10/60	0830	Loaded the incinerator with trash, but could not burn due to the monitor not working (pump on ashcan will not work)
1/11/60	1340	Started to burn trash in the incinerator
1/12/60	0900 1445	Emptied incinerator of ash and started burning trash in the incinerator Dumped ashes from incinerator and started burning in the incinerator
1/13/60	0045 1045 1500	Incinerator monitor shut down Started to burn trash in the incinerator Dumped ashes from the incinerator
1/14/60	0945 1500	Started burning trash in incinerator Removed ashes and shutdown rotoclone on incinerator
1/15/60	0830 2000	Burning trash in incinerator Ashes dumped from incinerator
1/16/60	0845	Started burning trash in incinerator
1/17/60	1900	"No entry" signs posted around incinerator area
1/24/60	0670 1800 2100	Started burning trash in the incinerator Started burning trash in the incinerator Incinerator burned out - roto-clone still in service
1/25/60	0115 2130	Started burning trash in the incinerator Started burning trash in the incinerator
1/26/60	0530 1345	Started burning trash in the incinerator Refilled incinerator slurry with clean water
2/1/60	1700	Started burning trash in the incinerator
2/2/60	0600	Ashes dumped from incinerator and reloaded
2/6/60	1645	Started burning trash in the incinerator

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
DLCS 2390401
T-641317

TABLE XV (cont'd)

LOG OF INCINERATOR OPERATION

2/7/60	1100 1630	Ash drum removed from incinerator then started to burn trash Started burning trash in the incinerator
2/8/60	0915 1700	Started burning trash in the incinerator Started burning trash in the incinerator
2/9/60	2000	Ash drum removed from incinerator then started to burn trash
2/12/60	0930	Operating incinerator - test crew running test
2/13/60	0440 1125	Dumped ashes from incinerator and reloaded Started to burn trash
2/14/60	0910	Loaded incinerator and started to burn trash
2/15/60	0130	Operating incinerator - performing DL-S-119
2/16/60	1030 1715	Emptied ashes from incinerator and reloaded Started to burn trash
2/17/60	0915	Started to burn trash
2/18/60	0845	Emptied ashes from incinerator
2/27/60	1240	Started to burn trash
3/3/60	0130	Emptied ashes from incinerator and started to burn trash

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
DLCS 2390401
T-641317

TABLE XVI

LOG OF TANK TO TANK CHANGE

11/2/59	0515 - 0540 1940 - 2040	Decant 1A chem. to 1B special Decant 1A chem. to 1A special
11/4/60	0945 - 1200 2345	Liquid from B surge used for stripping stripper bottoms to C surge and B test tank. Drained 10 per cent of A non-active into A chemical
11/6/59	1315	Decant B chemical to B special
11/8/59	8010 - 0910	Decant B chemical to B special
11/11/59	1715	B special transferred to A and B chemical for further treatment
11/13/59	0930 - 1000	A chemical to B special
11/14/59	1355 - 1520	A chemical to B special
11/15/59	0910 - 0940	A chemical to A special (chemical level 10 per cent)
11/16/59	1040 - 1108 1112 - 1240	A special to A chemical (chromated) B chemical to B special
11/18/59	2100 - 2140	Decant A chemical to B special
11/20/59	0845 - 0920 0920 - 0935	A chemical to B special A chemical to A special
11/23/59	1715 - 1830 1830 - 2140	B surge to A test B surge to B test
11/25/59	2140 - 2240	B chemical to A special
11/26/59	0310 - 0415 1015	Decanting B chemical to B special B surge to B test
11/27/59	0335 - 0415 0905 2315	B chemical to B special A chemical to B special B surge to A test

TABLE XVI (cont'd)

LOG OF TANK TO TANK CHANGE

11/28/59	0525 - 0625 1330 - 1350	A chemical to A special A chemical to B special
11/29/59	0320 - 0340 1905 - 2040	A chemical to B special A chemical to B special
12/2/59	0930 - 1410	B surge to A test thru 1 X's
12/6/59	1730 - 1800	Decanting B chemical to B special
12/7/59	1005 0230 0230	Drained 1A non-active to 1A special (some) Decanting 1A chemical to 1A special Draining 1A non-active to 1A chemical
12/9/59	1315 1315	Decanting 1A chemical to 1B special Transferred 1B chemical to 1A chemical (some)
12/10/59	0230 1255	B special discharged to trench to D surge and decay 1B surge tank to 1B test tank
12/11/59	0030 - 1300 0400 0830	B surge and decay to A test tank Educted A Resin Storage Tk. to D surge and decay Educted B Resin Storage Tk. to C surge and decay transferred 20 per cent A special to B special
12/12/59	0430 - 0530 1800	Decanting A chemical to A special Draining A special to trench to D surge and decay
12/13/59	0230 - 0310 0805 - 1430	Decanting A chemical to A special Educting A special to D surge
12/14/59	1920 - 2030	primary storage Tk. to Canal Storage Tk.
12/16/59	2035 - 2105	Educted 1B Resin Storage to 1C Surge Tank
12/18/59	0900 - 0915	Decanted 14 per cent B chemical to B special
12/19/59	1040	Decanted 22 per cent B chemical to A special
12/20/59	1400	Pumped 20" Water Gravity Drain Tk. to 1C surge

TABLE XVI (cont'd)

LOG OF TANK TO TANK CHANGE

12/21/59	1730 2310	B special drained to trench then pumped to D Surge Decanting B chemical to B Special
12/22/59	0000 - 0440 0440 - 0515 0515 - 1000	Educting 85 per cent B special to D surge Pumping B chemical to B special B special to D surge - 58 per cent
12/24/59	1345 - 2400	A special to Trench Sump and educting to C Surge
12/25/59	0000 - 0430	A special educting to C Surge
12/26/59	1600 - 1710 1710 - 1800	Started decanting 1A Chemical to 1B Special 1A Chemical at 33 per cent level after filling 1B Special started decanting balance to 1A Special. 1A Chemical after decanting - 11 per cent.
12/27/59	0130 - 0345 1330 - 1645	1B Special to 1C Surge Adding water to spray recycle tank from 1C Surge
12/28-29/60	1930 - 0600	1A Special to Trench Sump and to B Surge
12/30/59	2240	1A Special to Trench Sump and educting to B Surge
1/4/60	1740 - 1845	1B Chemical decanted to 1B Special 1B Chemical (45 per cent), 1B Special (81 per cent)
1/5/60	0215 - 0600 0920 - 1615 1050 - 1145 1150 - 1210 1300 - 1315 1615 - 0130	Canal Storage Tank to D Surge Canal Storage - Start 3', Stop 3.5" 1D Surge - Start 0', Stop 45 per cent 1C Surge to 1B test thru 1 X's D-C-B 1B Special to trench sump and educting to 1B Surge 1B Special to 1A Special via 1A Chemical transfer pump - trying to mix tanks so that contents may be discharged to river. Level at 43 per cent. 1B Special to 1A Special, 1A Special at 86 per cent 1C Surge to 1A Test (100 per cent)
1/6/60	0950 - 1415 1515 - 1900	1A Special to trench sump and educting to 1B Surge Educting from 1C Surge through 1 X D-C-B to 1B Test (50 per cent)

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
DLCS 2390401
T-641316

TABLE XVI (cont'd)

LOG OF TANK TO TANK CHANGE

1/7/60	0905 - 2020 1115 - 1150 2020 -	Started educting from C Surge through 1 X D-C-B to B Test Transferred 1A Special to 1B Special in order to repair valve No. 43-H16-13. Valve repaired by 1400 (diaphragm replaced). C Surge to A Test
1/8/60	- 0045 0615 - 0705 0840	C Surge to A Test Decanting 1B Chemical to 1A Special Educting from C Surge through 1 X D-C-B to B Test
1/9/60	1340 1350 - 1410 2240	Decanting from C Surge through 1 X D-C-B to B Test Decanting A Chemical to B Special Waste Educting 1B Special to 1B Surge
1/10/60	0920 - 1045 2255	Educting 1A Chemical to 1B Special 1B Special to 1C Surge
1/11/60	- 0130 0850 - 1130 0940 - 1130 1905 - 2030 2245	1B Special to 1C Surge Educting 1A Resin to 1D Surge 1A Surge through 1 X D-C-B to 1B Test 1D Surge to 1B Test 1A Special to 1B Surge
1/12/60	- 0110 0845 - 1325 1100 1400	1A Special to 1B Surge 1D Surge through 1 X D-C-B to 1A Test Educted 1B Resin to 1B Surge Transferring from 1D Surge to 1B Surge
1/13/60	1450 - 1545 1750	1C Surge through 1 X D-C-B to 1B Test 1B Special to Trench Sump and educting to 1C Surge
1/15/60	1800	Decanted 20 per cent from 1B Chemical to fill 1B Special Waste at 85 per cent
1/16/60	0445 - 1810 1300 - 1445	Educting 1B Special to 1C Surge via trench sump. Decanting 1B Chemical to 1B Special
1/18/60	1000	1B Chemical to 1A Chemical
1/20/60	0030 1120 - 1910	Educted 1 X sump and trench sump to 1C Surge 1B Special to 1C Surge

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
DLCS 2390401
T-641316

TABLE XVI (cont 'd)

LOG OF TANK TO TANK CHANGE

1/23/60	0245 - 1300	B Special to trench sump to C Surge Tk.
1/25/60	0650 1450	A Special to trench sump to D Surge Tk. B Surge to 1A Test Tk. (To check high level alarm)
1/26/60	1000 1040	B Surge to 1A Test Tk. (To check high level alarm) Educted 1A Resin Stor. Tk. to 1D Surge Tk.
1/27/60	1845	Educted 1B Surge to 1D Surge (Too "hot" to discharge to river)
1/28/60	2015 - 2230	1A Test Tk. to 1D Surge Tk.
1/29/60	0900 - 1315	Draining 1B Special to trench sump to D Surge Tk.
1/30/60	0000 1415 - 1510	Educted 1A Special to D Surge Tk. Pumped B Surge to 1A Test Tk.
2/1/60	1800 - 0145	C Surge to 1 X D.C.B.A. to 1A Test Tk.
2/3/60	1345 1645	Drained 1A Non-active to 1A Chemical Discharged 1C Surge to 1 X D.C.B. to 1B Test Tank
2/5/60	0900 2150	Drained 1A Special to 1A Surge Discharged 1C Surge to 1 X C.B.A. to 1B Test Tank
2/6/60	1715 - 1800	Discharged 1C Surge to 1 X C.B.A. to 1B Test Tank
2/9/60	0030 - 0130 0900	Pumped 1D Surge to Spray Recycle Tank Pumped 1C Surge to 1A Test Tank
2/12/60	1150	Pumped 1A Non-active to 1A special
2/16/60	1000 - 1605	Discharged 1C Surge to 1B Test
2/18-19/60	1715 - 0620	Discharged 1B Special to 1B Surge
2/26/60	0930 - 1055 1700 - 2145	Decanted 1A Chemical to 1B Special Pumped 1B Special to 1A Chemical
2/27/60	1050	Pumped 1C Surge to (1 X) D-C to 1A Test Tk.

TABLE XVI (cont'd)

LOG OF TANK TO TANK CHANGE

2/28/60	0830 - 1105	Pumped 1C Surge to (1 X) D-C-B to 1A Test Tk.
2/29/60	0945 - 1000	Educting from 1A Resin Storage Tk.
	1050 - 1100	Educting from 1B Resin Storage Tk.
2/29/60	1220 - 0005	Pumped 1C Surge to (1 X) C-B to 1A Test Tk.
3/2/60	0930	Decanted 10 per cent of 1A Chemical to 1A Special
	1445	Pumped 1C Surge to (1 X) C-B-A-D to 1B Test Tk.
3/3/60	0200	Transferred 20 per cent of 1A Chemical to 1B Special
3/4/60	0000 - 1415	Discharged 1C Surge to (1 X) B-A-D to 1B Test Tk.
	0435 - 0520	Pumped 1A Chemical to 1A Special
	0930 - 1015	Decanted 1A Chemical to 1B Special
3/7/60	1100 - 1815	Pumped 1D Surge to (1 X) C-B-A-D to 1A Test Tk.
3/11/60	0300	Decanted 1B Chemical to 1A Chemical
	1005 - 1600	Pumped 1A Surge to (1 X) 1C to 1B Test Tk.
3/12/60	1400 - 2000	Discharged 1B Test to 1A Surge
3/14/60	1350 - 1500	Decanted 1A Chemical to 1B Special
3/14-15/60	1645 - 1105	Pumped 1A Surge to (1 X) B-A-D-C to 1B Test Tk.

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XVII

LOG OF ACTIVITY OF CANAL WATER DEMINERALIZERS

Date	Influent		1A Demin. Effluent		1B Demin. Effluent	
	γ -Act.	dpm/ml	γ -Act.	dpm/ml	γ -Act.	dpm/ml
12/20/59		228 \pm 16		Bkgd.		Bkgd.
12/23/59		21.3 \pm 10.3		26.3 \pm 10.5		16.3 \pm 10.1
12/28/59		6.75 \pm 10.0		43.8 \pm 8.3		17.5 \pm 10.0
1/1/60		Bkgd.		Bkgd.		Bkgd.
1/2/60		248 \pm 16		21 \pm 14		26 \pm 14
1/3/60		169 \pm 11		32 \pm 10		30 \pm 10
1/4/60		45 \pm 10		Bkgd.		Bkgd.
1/5/60		35 \pm 10		Bkgd.		Bkgd.
1/6/60		32.5 \pm 10.1		Bkgd.		Bkgd.
1/7/60		47.5 \pm 10.1		20 \pm 9.95		18.8 \pm 10.0
1/8/60		31.2 \pm 14.4		Bkgd.		Bkgd.
1/9/60		32.1 \pm 14.1		Bkgd.		Bkgd.
1/11/60		183 \pm 15.5		Bkgd.		Bkgd.
1/12/60		62.3 \pm 10.6		31.2 \pm 10.4		24.7 \pm 10.4
1/13/60		24.7 \pm 10.5		Bkgd.		13.0 \pm 10.4
1/14/60		19.5 \pm 10.5		Bkgd.		Bkgd.
1/15/60		31.2 \pm 10		Bkgd.		22.1 \pm 10
1/16/60		15.6 \pm 10.3		Bkgd.		11.7 \pm 10.3
1/17/60		31 \pm 10		14 \pm 10		28 \pm 10
1/18/60		21.4 \pm 8.5		19.3 \pm 8.5		Bkgd.
1/19/60		15.5 \pm 9.5		Bkgd.		Bkgd.
1/20/60		Bkgd.		17.8 \pm 9.4		13.1 \pm 9.4
1/21/60		20.8 \pm 10.3		23.4 \pm 10.3		23.4 \pm 10.3
1/22/60		20.2 \pm 9.4		16.7 \pm 9.4		Bkgd.
1/23/60		Bkgd.		27.4 \pm 9.4		20.2 \pm 9.4
1/24/60		Bkgd.		17.9 \pm 9.4		13.1 \pm 9.3
1/25/60		Bkgd.		10.4 \pm 9.2		Bkgd.
1/26/60		Bkgd.		45.2 \pm 9.6		59.5 \pm 9.8
1/27/60		10.7 \pm 9.4		Bkgd.		44.0 \pm 9.5
1/28/60		19.0 \pm 9.5		40.5 \pm 9.6		16.7 \pm 9.5
1/29/60		13.1 \pm 9.4		10.7 \pm 9.4		Bkgd.
1/30/60		25.0 \pm 9.4		Bkgd.		15.5 \pm 9.4
1/31/60		19.4 \pm 14.8		Bkgd.		Bkgd.
2/1/60		11.9 \pm 9.4		13.1 \pm 9.4		Bkgd.
2/2/60		13.1 \pm 9.4		15.5 \pm 9.4		Bkgd.

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XVII (cont'd)

LOG OF ACTIVITY OF CANAL WATER DEMINERALIZERS

Date	Influent		1A Demin. Effluent		1B Demin. Effluent	
	γ -Act.	dpm/ml.	γ -Act.	dpm/ml	γ -Act.	dpm/ml
2/3/60	16.7	\pm 9.4	20.2	\pm 9.4	27.4	\pm 7.9
2/4/60	20.2	\pm 9.5	Bkgd.		23.8	\pm 9.5
2/5/60	26.2	\pm 9.5	Bkgd.		22.6	\pm 9.5
2/6/60	75.0	\pm 9.8	Bkgd.		25.0	\pm 9.5
2/7/60	27.4	\pm 9.5	Bkgd.		13.1	\pm 9.4
2/8/60	Bkgd.		Bkgd.		11.9	\pm 9.4
2/9/60	22.6	\pm 9.5	22.6	\pm 9.5	16.7	\pm 9.5
2/10/60	14.3	\pm 9.5	Bkgd.		Bkgd.	
2/11/60	Bkgd.		Bkgd.		16.7	\pm 9.5
2/13/60	Bkgd.		32.1	\pm 9.5	22.6	\pm 9.5
2/14/60	9.5	\pm 9.4	Bkgd.		9.5	\pm 9.4
2/15/60	126.2	\pm 10.2	Bkgd.		11.9	\pm 9.5
2/16/60	93	\pm 9.9	44.1	\pm 9.6	32.3	\pm 9.5
2/17/60	46.4	\pm 9.6	22.6	\pm 9.5	19	\pm 9.5
2/19/60	14.3	\pm 9.4	21.4	\pm 9.4	14.3	\pm 9.4
2/20/60	29.8	\pm 9.5	61.9	\pm 9.7	Bkgd.	
2/22/60	Bkgd.		Bkgd.		19.0	\pm 9.5
2/24/60	17.9	\pm 9.3	9.5	\pm 9.3	20.2	\pm 9.3
2/26/60	Bkgd.		Bkgd.		Bkgd.	
2/29/60	18.2	\pm 7.0	Bkgd.		Bkgd.	
3/2/60	15.4	\pm 9.3	11.9	\pm 9.3	11.9	\pm 9.3
3/4/60	Bkgd.		Bkgd.		15.5	\pm 9.3
3/6/60	Bkgd.		Bkgd.		14.3	\pm 9.3
3/9/60	21.6	\pm 9.4	15.6	\pm 9.4	26.2	\pm 9.4

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XVIII

LOG OF TANKS RECEIVING

11/2/59	0001	B Surge B non-active B special B chemical	11/14/59	0800 1205 1520	B special A non-active A special
	0540 1630 1700	A special C surge A non-active	11/16/59	0805 0950 1240 1245	B non-active B special A special B chemical
11/3/59	0000 0305 1530 2120	B surge B special B non-active C surge	11/17/59	1000	A non-active
			11/18/59	0210 1040 2140	B special B non-active A special
11/4/59	0920 1820 1830	A non-active A chemical A special	11/19/59	1000 1450	A non-active B special
11/5/59	0305 1535 2210	B non-active A non-active B special	11/20/59	0920 1015 2145	A special B non-active A chemical
11/6/59	0850 1340	B non-active A special	11/21/59	0035 1445	B special A non-active
11/7/59	1100 1430	A non-active B special	11/22/59	0800 1920	A special B non-active
11/8/59	2215	A special	11/23/59	0345	B special
11/9/59	0900	B non-active	11/24/59	2400	A non-active
11/10/59	0300 0830 2355	B special A non-active B non-active	11/25/59	0600 1300	B non-active A special
			11/26/59	2400 0415 1000	B special B chemical A non-active
11/12/59	0005 1140 2340	A non-active B special B non-active	11/27/59	0940	A special
11/13/59	1005	A special			

TABLE XVIII (cont'd)

LOG OF TANKS RECEIVING

11/28/59	0625 1130	B special B non-active	12/8/59	2400	A non-active C surge and decay
11/29/59	0340 1905	A special B special			A resin storage IX. A.D.C.
11/30/59	0200 1805 2015	A special A chemical A non-active	12/9/59	2400	B non-active B special D surge and decay
12/1/59	0410 1455 2210	B special B non-active A special			A resin storage IXs - A.D.C.B.
12/2/59	0645 1405 2150	A non-active B special B non-active	12/10/59	2400	B non-active A special C surge and decay
12/4/59	0015 1145 1505	A non-active A special B non-active			A resin storage IX. A.D.C.B.
12/5/59	1445 1610	B special A non-active	12/11/59	2400	A special C surge and decay
12/6/59	1720 1800 1800	B non-active A special B chemical			A resin storage IX. X.D.C.B.
12/7/59	2400	B non-active A special B chemical C surge and decay A resin storage IX A.D.C.	12/12/59	2400	IX. D.C.B.
			12/13/59	2400	IX. D.C.B.
			12/14/59	2400	B non-active B special A chemical C surge and decay
					A resin storage IX D.C.B.
			12/15/59	2400	A non-active A special

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XVIII (cont'd)

LOG OF TANKS RECEIVING

12/15/59	2400	A chemical C surge and decay B resin storage IX D.C.B.	12/21/59	2400	A non-active A special C surge B chemical A resin IX. D.C.B.
12/16/59	2400	B non-active A special A chemical C surge and decay A resin storage IX D.C.B.	12/22/59	2400	B non-active B special D surge A chemical A resin IX. D.C.B.
12/17/59	2400	A non-active B special A chemical A resin storage C surge and decay IX D.C.B.	12/23/59	2400	A non-active A special C surge B chemical A resin IX. D.C.B.
12/8/59	2400	A non-active B special A chemical C surge A resin storage IX D.C.B.	12/24/59	2400	1A non-active 1B special 1B chemical 1B resin storage 1C surge IX. D.C.B.
12/19/59	2400	B non-active A special A chemical C surge and decay A resin storage IX D.C.B.	12/25/59	0000	1B non-active A special B chemical C surge B resin IX. D.C.B.
12/20/59	2400	B non-active B special B chemical C surge and decay A resin storage IX D.C.B.	12/26/59	0000	B non-active A special B chemical C surge

TABLE XVIII (cont'd)

LOG OF TANKS RECEIVING

12/26/59	0000	B resin IX. D.C.B.	1/1/60	0000	A chemical B surge B resin IX. D.C.B.
12/27/59	0000	B surge B resin B non-active A special B chemical IX. D.C.B.	1/7/60	0000	B non-active A special A chemical B surge B resin IX. D.C.B.
12/28/59	0000	B non-active A special B chemical B surge B resin IX. D.C.B.	1/8/60	0000	A non-active A special A chemical B resin B surge IX. D.C.B.
12/29/59	0000	A non-active B special B chemical B surge B resin IX. D.C.B.	1/9/60	0000	A non-active A special B surge B resin A chemical IX. D.C.B.
12/30/59	0000	B non-active A special B chemical B surge B resin IX. D.C.B.	1/10/60	0000	A non-active A special B chemical B surge B resin IX. D.C.B.
12/31/59	0000	A non-active B special A chemical B surge B resin IX. D.C.B.	1/11/60	0000	A non-active A special B chemical B resin B surge IX. D.C.B.
1/1/60	0000	B non-active A special			

NOTE: Dates 1/2/60 through 1/6/60 are found on page 77.

DUQUESNE LIGHT COMPANY
 POWER STATIONS DEPARTMENT
 SHIPPINGPORT ATOMIC POWER STATION

PERIODIC WASTE DISPOSAL MATERIAL BALANCE TEST
 DLCS 2390401
 T-641317

TABLE XVIII (cont'd)

LOG OF TANKS RECEIVING

1/12/60	0000	B non-active B special B surge B chemical B resin IX. D.C.B.	1/18/60	0000	A non-active A special A chemical C surge A resin IX. D.C.B.
1/13/60	0000	B non-active B special C surge B chemical B resin IX. D.C.B.	1/19/60	0000	B non-active B special B chemical C surge A resin IX. D.C.B.
1/14/60	0000	A non-active A special B chemical C surge A resin IX. D.C.B.	1/20/60	0000	A non-active A special B chemical C surge A resin IX. D.C.B.
1/15/60	0000	B non-active A special A chemical C surge A resin IX. D.C.B.	1/21/60	0000	B non-active A special C surge B chemical A resin IX. D.C.B.
1/16/60	0000	A non-active A special A chemical C surge A resin IX. D.C.B.			
1/17/60	0000	A non-active A special A chemical C surge A resin IX. D.C.B.			

TABLE XVIII (cont'd)

LOG OF TANKS RECEIVING

1/2/60	0000	B non-active A special A chemical B surge B resin 1X. D.C.B.
1/3/60	0000	B non-active A special A chemical B surge B resin 1X. D.C.B.
1/4/60	0000	B non-active A special A chemical B surge B resin 1X. D.C.B.
1/5/60	0000	A non-active A special A chemical B surge B resin 1X. D.C.B.
1/6/60	0000	B non-active B special A chemical B surge B resin 1X. D.C.B.

TEST RESULTS DLCS 2390A01

T-641317

PERIODIC WASTE DISPOSAL SYSTEM MATERIAL BALANCE TEST

Results Prepared By Robert M. Kuhn

Results Reviewed By John Frankel Jr.

Approved (Duquesne Light Company) George A. Santel Date 6-14-61