MASTER

DUQUESNE LIGHT COMPANY
SHIPPINGPORT ATOMIC POWER STATION

TEST RESULTS

DLCS 1690203
T-612075

RADIOACTIVE WASTE DISPOSAL SYSTEM PERIODIC
RADIATION MONITORING SURVEY

CORE I SEED 1

Section 2 of 3 Sections

First Issue,

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TEST RESULTS

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RADIOACTIVE WASTE DISPOSAL SYSTEM PERIODIC RADIATION MONITORING SYSTEM

CORE I SEED 1

Purpose

To periodically determine the radiation levels at all permanently installed monitored points in the Radioactive Waste Disposal Area and also to determine the effectiveness of shielding facilities in working areas.

Conclusions

Radiation levels were generally higher than those measured during the previous performances of this test, however, the majority of points surveyed in the RWD Area indicated a radiation level of less than 5 mr/hr, which is the Health Physics limitation for the Waste Disposal Area. Any areas above this level (5 mr/hr) are controlled areas posted with warning signs.

Shielding in the RWD Area was adequate.

Description of Test Equipment and Test Procedure

The radiation levels were obtained at a majority of the monitored points in the Radioactive Waste Disposal Area from the RWD Radiation Monitoring Panel and installed "Frisker" stations. A general radiation survey of the RWD Area was made using a Thyac and Cutie-Pie radiation instruments. The activity level of material which was burned in the incinerator was measured before and after burning. Readings of the air sampler located in the incinerator area were taken before, during, and after operations. During a drumming operation, radiation measurements were made during drumming and rolling. Part VI-H of the test procedure was not performed as no transfer of the materials outlined (radioactive gas, resin, coolant and waste) occurred during this test.

Results

DLCS 1690203 was performed on February 10 and 12, and March 18 and 23, 1960. The Plant had been shutdown for refueling since October 7, 1959.

Three out of five "Frisker" stations in RWD Plant were removed by Health Physics prior to this test for repair and calibration. The two remaining stations have since been recalibrated.

Data obtained from the RWD Monitoring Panel and "Frisker" stations are contained in Tables I and II. The data from incinerator and drumming operations are contained in Tables III and IV, and Figures 1 and 2. Figures 3, 4, 5 and 6 show the radiation levels at various locations in the RWD Plant and in the surrounding areas.

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There were several areas in which the activity was greater than the Health Physics limit of 5 mr/hr. These areas were the incinerator and drumming area (maximum 90 mr/hr - contact with ash drum), the 1-A chemical waste tank area (50 mr/hr - contact), the evaporator area (14 mr/hr contact), and the area in proximity of a contaminated waste pile (10 mr/hr - generally near resin storage area). The high activity in the ash collection drum, the 1-A chemical waste tank, and the evaporator was due to normal operations.

The over-all radiation level of the RWD Plant was slightly higher in this performance than in the previous one. This was due to the presence of more contaminated waste in the RWD Area than existed previously. Most of the points measured at the walk-ways and between tanks were above background level (.03 mr/hr) though below the Health Physics limit of 5 mr/hr.

In the area behind the Waste Disposal Building, the highest readings (excluding the drummed waste storage area) were measured near the spray and recycle tank (0.6 mr/hr) and the 1-B surge tank (0.6 mr/hr).

Calibration data of the survey instruments used in the performance of this test are contained in Tables V and VI.

FIGURE 1

INCINERATOR EQUIPMENT AREA RADIATION LEVELS AFTER
 END OF BURNING (2-12-60)*

All readings are in mr/hr.

* All readings are Thyac No. 869 except those greater than 10 mr/hr, which were measured using Cutie-Pie No. 3439.

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FIGURE 2

RADIATION LEVEL OF DRUM AFTER ROLLING (2-10-60)*

*All readings are contact and in mr/hr; survey meter: Cutie-Pie No. 3426; rolled approximately one (1) hour after filled.

FIGURE 3
RADIATION SURVEY IN WASTE DISPOSAL BUILDING

All readings are in mr/hr.
(C) indicated contact readings
(C) or distance from indicated
object.
Survey meter: Thyac No. 878

FIGURE 4

RADIATION SURVEY OF WASTE DISPOSAL CHEMICAL WASTE TANKS

All readings are in mr/hr.
(C) denotes contact reading
Survey meter: Thyac No. 878

FIGURE 5

RADIATION SURVEY OF WASTE DISPOSAL TANKS AND AREA WEST OF WASTE DISPOSAL BUILDING

All readings are in mr/hr.
(C) denotes contact Reading
Survey meter: Cutie-Pie No. 4046

FIGURE 6

RADIATION SURVEY OF AREA OUTSIDE WASTE DISPOSAL BUILDING (EAST)

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TABLE I

RWD ACTIVITY LEVELS

Date: February 18, 1960

Item	Radiation
1A, 1B, 1C and 1D surge and decay tanks activity levels	less than 0.1 R/hr
1A and 1B resin storage tanks activity levels	less than 0.1 R/hr
1A, 1B, 1C, and 1D gas decay drums activity levels	2.4 cps
Vent gas surge drum activity level	2.3 cps
Evaporator bottoms monitor reading	2.5 cps
Stack gas monitor reading	0 cps
Effluent water monitor	0.0.S.

TABLE II

"FRISKER" STATION ACTIVITY

Date: February 18, 1960

Location	Radiation
Incinerator room	Removed for repair
Access passage to gas stripper cubicle	Removed for repair
Access passage to gas decay drums	Removed for repair
RWD Control Room	Less than 50 cpm
Stairway to basement of RWD Plant	70 cpm

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TABLE III

INCINERATOR OPERATIONS DATA

Date: February 12, 1960

Item	Time	Radiation
General activity of waste before burning*	0915	2 mr/hr
Reading of air sampler in incinerator room **	0923-1515	360 cpm
Reading of channel No. 3, RWD monitoring panel, stack gas throughout test	0923-1515	less than 10 cps
Radiation rec'd by operator during incinerator operation (dosimeter)	0923-1515	42-38=4 millirem
Highest contact activity of drum after receiving ashes from incinerator (highest level was at the bottom)	1515	70 mr/hr
General contact level at surface of rotoclone	1515	1 mr/hr
Highest contact activity of gas scrubber (highest level was at lowest point on scrubber)	1515	6 mr/hr

* Thyac 869

** 4 CFM intake

TABLE IV

DRUMMING OPERATIONS DATA

Date: February 10, 1960

Item	Time	Radiation
Evaporator Bottoms (contact radiation level)*	1055	140 mr/hr
Radiation rec'd by operator during drumming operations**	1100-1115	50-48=2 millirem
General field one (1) foot from top of drum***	1100	30, 60, 90 mr/hr
General field one (1) foot from top of drum***	1112	100 mr/hr
General field one (1) foot from top of drum***	1114	110 mr/hr
General field one (1) foot from top of drum***	1115	115 mr/hr

* Cutie-Pie No. 4095

** Dosimeter reading

*** Cutie-Pie No. 3426; meter held in various locations

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TABLE V

RWD RADIATION MONITORING PANEL CALIBRATION DATA

Item (Channel No. 2.)	Calc/Meas.
1A Gas decay drum	24.8/26
1B Gas decay drum	24.8/24
1C Gas decay drum	24.8/24
1D Gas decay drum	24.8/20

- NOTE:
- (1) Calibration data on gas decay drums obtained on August 8, 1959.
 - (2) Calibration data on remainder of channel No. 2, channel No. 1 and channel No. 3 may be obtained from DLCS 1690201. Since this calibration data is over one year old, it was not presented here.
 - (3) The Anton air sampler (29-S3-2) was not performing properly during this performance; therefore, no calibration data are presented.
 - (4) Channel No. 4 was out of service during the performance of this test.

TABLE VI

PORTABLE RADIATION SURVEY METER CALIBRATION DATA*

Instrument	No.	Date	Calc/Meas	Calc/Meas	Calc/Meas	Calc/Meas	Calc/Meas	Calc/Meas	Calc/Meas
Thyac	869	2-5-60	0.15/0.15	1.5/1.5	5/5	15/15			
Thyac	878	2-5-60	0.15/0.2	1.5/1.5	10/11	15/15			
Cutie-Pie	4046	3-15-60	5/5	15/15	25/25	50/50	100/100	1R/1R	1.5R/1.5R
Cutie-Pie	4095	1-26-60	5/5	25/25	50/50	250/250	500/500	1R/1R	1.5R/1.5R
Cutie-Pie	3426	12-30-59	10/10	15/15	50/50	150/150	500/480	1R/1R	
Cutie-Pie	3439	2-1-60	5/5	15/15	25/25	100/100	200/250	1R/1R	1.5R/1.5R

* Calibrations in mr/hr, except as noted.

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Date

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