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HW--30751

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Mr. J. H. Warren, Manager
Reactor Section
HANFORD ATOMIC PRODUCTS OPERATION

REACTOR SECTION
RADIATION MONITORING SUB-SECTION MONTHLY REPORT (ADMINISTRATIVE)
January, 1954

I. RESPONSIBILITIES

Assigned responsibilities of the Radiation Monitoring Sub-Section were not changed during January.

II ACHIEVEMENT

A. Operating Experience

1. Statistics

The following statistics were compiled for the month of January, 1954. The data for December are also included for comparison. The statistics are presented in the following table:

	B	C	D	DR	F	H	Total	B	C	D	DR	F	H	Total	To Date
Special Work Permits	149	128	140	186	153	100	756	127	109	93	73	85	226	713	713
Routine & Special Surveys	410	479	508	279	458	204	2338	396	348	347	319	380	289	2079	2079
Retention Basin	183	275	166	225	173	183	1205	140	201	134	322	125	140	1062	1062
Air Monitoring Samples	55	63	65	31	77	43	334	42	67	39	42	110	70	370	370
Hand Contamination Cases	0	4	1	0	0	2	7	0	0	1	0	0	7	8	8
Skin Contamination Cases (other than hands)	2	10	3	1	9	3	28	1	4	1	1	4	17	28	28

Retention Basin Effluent

The activity of the water leaving the retention basins was as follows:

	100-B	100-C	100-D	100-DR	100-F	100-H
Average beta dosage-rate (mrep/hr)	3.0	2.5	3.4	5.4	3.0	2.3
Average gamma dosage-rate (mr/hr)	7.9	4.0	7.9	10.2	5.6	5.9
Average total dosage-rate (mrep/hr)	10.9	6.5	11.3	15.6	8.6	8.2
Average integrated dose in 24 hrs.	262	156	271	374	206	197
Maximum integrated dose in 24 hrs.	350	206	326	430	317	293
Maximum integrated dose in 24 hrs. 1954	350	206	326	430	317	293

Classification Canceled (Change)

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By Authority of

DS Lewis 6/19/92
Doc Kroger 9/4/92
JE Savely 9-4-92

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2. Activities

There were sixteen slug failures during the month; seven at the 105-C reactor, two at the 105-DR reactor, and seven at the 105-H reactor. Following the removal of a "J" metal ruptured slug at the 105-DR reactor, gas evolved from the slug while in the storage basin causing a maximum dose rate of 10 rep/hr at the surface of the water. It was canned with the use of Chemox masks. A sample of the gas taken was identified as Xe¹³³ and Xe¹³⁵ by the control laboratory of the Biophysics Section. High level contamination was experienced at the 105-H reactor during the removal of a ruptured slug. A push pole used for the removal of the tube gave a dose rate of 200 rep/hr. Exposure rates up to 10 rep/hr were experienced in manipulating the pole. In the discharge area contamination caused dose rates as high as 15 rep/hr at one foot, and exposure rates as high as 5 rep/hr were encountered.

Two outages at the 105-H reactor were occasioned by leaky process tubes. Leak testing operations and miscellaneous shutdown work were performed without difficulty, except for the high level contamination encountered in the discharge area mentioned above.

The 105-F reactor was shutdown on January 24 for the venturi outage and remained down through the end of the month. Work performed during the outage requiring radiation monitoring included regular and special charge-discharge operations, horizontal safety rod repairs, leak testing of process tubes, venturi installation, Vanstone flange inspection, replacement of galvanized nozzles, removal of discharge area catwalks, and the removal and replacement of the "B" experimental hole facility. A slug lodged on a cocked tip-off during discharge operations and was removed by use of a long pole at a maximum exposure rate of 25 r/hr.

A dose rate of 50 rep/hr at the rear of process tube #2291 at 105-C reactor was attributed to a radioactive particle on top of the nozzle flange. The particle was removed by swabbing.

Attempts to repair gas leaks at the front of the 105-B reactor were unsuccessful. Dose rates up to 160 mrep/hr were observed at the work area entrance following startup of the reactor. As soon as the proper gas purity was attained, the radiation level subsided. Just prior to the extended outage at the 105-F reactor, dose rates due to radioactive gas increased to 50 mrep/hr including 8 mr/hr in the work area and 200 mrep/hr including 100 mr/hr on the manifold in the inner instrument room. It was assumed that leaks in the #8 horizontal safety rod thimble allowed entry of air into the reactor.

The use of unchlorinated water in one half of the 105-DR reactor continued to cause the 24-hour dose of the effluent water discharged from the reactor to exceed 360 mrep. The maximum 24-hour dose was 430 mrep. The increased dose was tolerated with the concurrence of the Radiological Sciences Department.

B. Equipment Experience

All equipment operated satisfactorily throughout the month.

C. Improvement Experience

No inventions or discoveries were reported by Radiation Monitoring Sub-Section personnel.

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D. Events Influencing Cost

The Radiation Monitoring Sub-Section cost to Reactor irradiation should be about the same as that accrued during December. Overtime requirements were high because of the extended outage experienced at the 105-H reactor, but did not exceed the overtime used during December.

E. Significant Reports Issued**1. Routine**

✓ "Reactor Section, Radiation Monitoring Sub-Section Monthly Report, (Administrative) December, 1953 (Rough Draft)" - HW-30448, dated 1-5-54.

✓ "Reactor Section, Radiation Monitoring Report for Month of December, 1953" - HW-30449, dated 1-5-54.

2. Non-Routine

✓ "Manufacturing Department - Radiation Incident Investigation, Class II, No. 67" - HW-30691, dated 1-29-54.

✓ "Manufacturing Department - Radiation Incident Investigation, Class II, No. 68" - HW-30681, dated 1-26-54.

✓ "Evaluation of Small-Filter Air Sampling" - HW-30633, dated 1-18-54.

III. PERSONNEL**A. Organization**

There were no organizational changes in the Radiation Monitoring Sub-Section during January.

B. Force Summary

	<u>Start of Month</u>	<u>End of Month</u>	<u>Net Change</u>
Monthly	20	20	0
Weekly	39	38	-1
Sub-Section Total	59	58	-1
Rotational Pool Tech. Grads.	0	0	0

The change in force during the month consisted of one termination.

C. Safety Experience

No major or sub-major injuries and no near-serious accidents were sustained by Radiation Monitoring Sub-Section personnel during January. Two minor injuries were sustained.

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D. Radiation Experience

Two Reactor Section employees were overexposed to radiation. A Mechanical Maintenance Unit employee received an exposure of between 160 to 1100 rep to a small spot on the back of his neck. An Operations Unit employee received an exposure of between 25 to 780 rep to a small spot on his left cheek and an exposure of 25 rep to a small spot on his right forefinger.

The table below gives the radiation experience of the Reactor Section for the month.

	100-B	100-C	100-D	100-DR	100-F	100-H	Total
Exposure hours	1840	1118	1260	934	1290	2092	8534
Incident frequency rate/1000 hrs.	0.0	0.90	0.0	0.0	0.0	0.96	0.36
Average severity/incident	0	5.0	0.0	0.0	0.0	3.0	3.7

There were two Class II and one Class I radiation incidents. Class II, No. 67*, Severity 5, involved the exposure of between 160 to 1100 rep to a small spot on the back of the neck of a Mechanical Maintenance Unit employee. A speck of highly radioactive material was deposited on his neck in the discharge area, 105-C reactor, or was transferred from his protective hood to his neck at the time of leaving the discharge area. The dose rate from the speck was determined to be in the order of 1900 rep/hr. Class II, No. 68*, Severity 5, involved the exposure of between 200 to 780 rep to a small spot on the left cheek and about 25 rep to a small spot on the right forefinger of an Operations Sub-Section employee. A radioactive particle giving a dose rate of about 300 rep/hr was deposited on his cheek in the discharge area, 105-H reactor, and was transferred to his finger during decontamination. Class I, No. 338*, Severity 1, occurred at the 105-H reactor when a Mechanical Maintenance employee received an estimated exposure of 365 mrep to the knee from contamination on the knee of his outer coveralls which gave a surface dose rate of 4.4 rep/hr. The source of the contamination was a splash shield in the discharge area.

* The Radiological Sciences Department's numbering system for radiation incidents was adopted by the Manufacturing Department on January 1, 1954.

E. Personnel Activities

At month end, no Rotational Training Technical Graduates were assigned to the Radiation Monitoring Sub-Section.

R. L. Daniels, Shift Supervisor, completed an evaluation of the use of circular filters two and one-half inches in diameter for determining air-borne activity concentrations.

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P. L. Jerman

Superintendent
Radiation Monitoring Sub-Section
Reactor Section

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