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September 3, 1954

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 Reactor Section
 SANFORD ATOMIC PRODUCTS OPERATION

This document consists of

4 pages No. 1
 1 copies, Series A

REACTOR SECTION
 RADIATION MONITORING SUB-SECTION MONTHLY REPORT
 August, 1954

RESPONSIBILITIES

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

ACHIEVEMENTA. Operating Experience1. Statistics

	<u>JULY</u>							<u>AUGUST</u>							1954 to Date
	<u>B</u>	<u>C</u>	<u>D</u>	<u>DR</u>	<u>F</u>	<u>H</u>	<u>Total</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>DR</u>	<u>F</u>	<u>H</u>	<u>Total</u>	<u>Date</u>
Special Work Permits	106	151	155	117	57	127	713	90	142	138	70	74	111	625	6304
Routine & Special Surveys	389	431	503	552	459	529	2863	472	544	494	381	497	539	2927	2201
Retention Basin	192	223	138	219	132	132	1036	180	155	138	233	134	162	1002	906
Air Monitoring Samples	40	32	73	59	135	84	423	49	50	69	71	73	79	391	28
Land Contamination Cases	2	0	1	7	3	0	13	4	1	0	0	3	0	8	10
Basin Contamination Cases (other than hands)	3	2	2	9	1	1	18	12	2	0	1	10	6	31	22

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 (mrads/hr)	2.9	2.5	3.1	4.1	3.0	4.4
Average gamma dosage rate (mr/hr)	4.6	4.0	6.2	9.1	8.0	11.6
Average total dosage rate (mrads/hr)	7.5	6.5	9.3	13.2	11.0	16.0
Average Integrated dose in 24 hours	180	176	223	317	264	384
Maximum Integrated dose in 24 hours	262	238	283	360	406	487
Maximum Integrated dose in 24 hours, 1954	460	391	670	682	482	854

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By Authority of

DS Lewis 6/19/92
 J. E. Savely 9-4-92

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2. Activities

There were ^{six} slug failures during the month, one at 105-B reactor, ^{two} one at 105-C reactor, ^{two} two at 105-DR reactor, and one at 105-F reactor. At the 105-B reactor, two Operations Unit employees were exposed to a radiation level of about 20 r/hr when the rear nozzle cap was loosened on a tube containing a ruptured slug, during preparation for a "quickie" discharge. Fission product from inside the tube were evidently washed into the gunbarrel as the cap was loosened.

Four process tubes were successfully charged at the 105-B reactor during reactor operation at an average exposure rate of 6 mrads/hr.

As part of the program to determine if the ground contamination within the 100-B area is fixed, a mass shoe check was made on approximately 250 employees at the end of the 8-4 shift on August 31, 1954. A radioactive particle was found on the sole of one shoe which read 8,000 c/m. Surveys made periodically throughout the month of ten ground plots established as various locations indicated little if any significant movement of particles. Plots originally void of particles continued to remain so. Others showed no significant change in the number or location of the particles.

One hundred-twenty tubes at the 105-C reactor were charged with J-Q metal. The maximum radiation level observed from a pallet of 10-66 metal was 50 mr/hr at 3 inches. The exposure rates established for working around a loaded pallet and for inspection of the metal were 40 and 25 mr/hr, respectively.

Smears taken in the 105-C reactor gas tunnel indicated contamination of 500 mrads/hr including 5 mr/hr on the floor and 1.2 rads/hr including 5 mr/hr on piping.

Excavation was made at the site of the oldest burial trench at 100-F area in an effort to reclaim perforated aluminum dummies which had been buried from 4 to 6 years. The dose rate from dummies ranged from 25 to 50 mr/hr at 2 inches. The maximum exposure rate for this work was 15 mr/hr.

A total of 216 vehicle surveys were made during the month. Eight cases of contamination were found, but none of the contamination observed appeared to be picked up from the ground.

The 24-hour dose of the effluent water discharged to the Columbia River exceeded 360 mrads at the 105-H reactor throughout the month, the maximum dose being 487 mrads. At the 105-F reactor the dose exceeded 360 mrads on one day. This resulted when it was necessary to direct the flow through one retention basin in order to accommodate water collected from a purge of the reactor during operation in the other basin. The 24-hour dose was 406 mrads. The increased activity was tolerated with the concurrence of the Radiological Sciences Department.

B. Equipment Experience

All radiation monitoring equipment operated satisfactorily during the month.

C. Improvement Experience

N.M. chambers were installed at the dummy elevators of the 105-B, DR, F, and H reactors as replacements for the portable Beckman survey meter for sorting dummies.

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C. Improvement Experience (continued)

The decontamination of dummies with nitric acid was adopted at the 105-C reactor. This new technique appears to have reduced the number of dummy rejects to well below one percent.

The installation of the new pressurized aluminum gamma monitoring H.M. chambers at the outlet of the 107-D retention basins was completed.

An instrument with a special chamber for the checking of perforated aluminum dummies for reuse has been developed by the Radiological Sciences Department. Further development of the supply hopper for receiving the dummies for passage through the chamber is required before the equipment has practical use in the field. The development of a method for decontaminating dummies with nitric acid and the use of charging trays for reclaimed dummies appears to have made this instrument obsolete.

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

D. Events Influencing Cost

The overtime used by the Sub-Section was about the same as used during previous month. Four additional employees were received on the roll during August. About \$1,000 was spent by the Sub-Section for the installation of H.M. chambers at the dummy elevators in the various reactors.

E. Significant Reports Issued

1. Routine

"Reactor Section, Radiation Monitoring Sub-Section Monthly Report (Administrative July, 1954, Rough Draft" - HW-32658-RD, dated August 4, 1954, author P.C. Jerman.

"Reactor Section, Radiation Monitoring Report for Month of July, 1954" HW-32659, dated August 4, 1954, author P. C. Jerman.

2. Non-Routine

"Manufacturing Department Radiation Incident Investigation, Class T, No. 378", HW-32768, dated August 16, 1954, author J. G. Myers.

III. PERSONNEL

A. Organization

M. L. Smith, a new hire, was received on the roll on August 30, 1954. His position title is Supervisor, Radiation Monitoring.

B. Force Summary

	Start of Month	End of Month	Net Change
Monthly	20	25	5
Weekly	21	25	4
Sub Section Total	72	76	4
Rotational Pool Tech Grad	0	0	0

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Force Summary (continued)

The force changes during the month consisted of three new hires, and one transfer from outside the Section.

C. Safety Experience

No major or sub-major injuries were sustained by Radiation Monitoring Sub-Section personnel during August. One minor injury was sustained.

D. Radiation Experience

No employees of the Reactor Section received a known overexposure to radiation during August.

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

	<u>100-B</u>	<u>100-C</u>	<u>100-D</u>	<u>100-DR</u>	<u>100-F</u>	<u>100-H</u>	<u>Total</u>
Exposure hours	2572	2856	1371	1559	1945	2195	12,498
Incident frequency rate/1000 hrs.	0.39	0	0	0	0	0.91	0.24
Average severity/incident	1.0	0	0	0	0	1.0	1.0

There were no Class II and three Class I radiation incidents. Class I, No. 378, Severity 1, occurred at the 105-B reactor on August 5, 1954, when fission product was apparently washed to the rear of a process tube containing a ruptured slug as the rear cap on the tube was loosened in preparation for a "quickie" discharge. Two Operations Unit employees were at the rear of the tube and received exposures of 195 and 165 mr, respectively, which were greatly in excess of the exposures planned. Class I, No. 381, Severity 1, and Class I, No. 382, Severity 1, both occurred at 105-H reactor on August 30, 1954. The first involved undue exposure to Pile Technology personnel as a sample was discharged from the P-13 assembly on the No. 1 experimental level. The maximum dose received was 150 mr to the general body and 400 mr to the hands. The second involved undue exposure to four employees as the result of contaminated water splashing on their coveralls when seating perfs were withdrawn from a process tube charged with 10-66 metal. The maximum clothing contamination was 750 mrad/hr at surface. In this case the employee's leg was contaminated up to 420 mrad/hr at surface and the exposure received was estimated at 150 mrad. The incidents were all investigated and were or will be reported separately.

E. Personnel Activities

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

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Radiation Monitoring Sub-Section
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