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AEC RESEARCH AND DEVELOPMENT REPORT

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OPERATIONS DIVISION

MONTHLY REPORT

FOR MONTH ENDING OCTOBER 31, 1951

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OPERATIONS DIVISION

MONTHLY REPORT

for

Month Ending October 31, 1951

by

M. E. Ramsey

DATE ISSUED FEB 14 1952

OAK RIDGE NATIONAL LABORATORY
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TABLE OF CONTENTS

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SUMMARY

1. Lost pile-operating time averaged 10.6%, compared to 9.0% in September and 9.8% for the year to date (p. 2).

2. One ruptured slug was detected and discharged during the month (p. 2).

3. The reason for the high rejection rates encountered in the testing of Al-Si bonded slugs is still not adequately understood (p. 2).

4. The Pile Department is now operating the hydrogen liquefier for the research groups (p. 3).

5. The chief difficulty in operation of the Low Intensity Testing Reactor (LITR) is malfunctioning of instruments (p. 3).

6. Two additional fuel elements were added to the LITR during the month, principally as compensation for poison effects of experimental equipment which was installed (p. 4).

7. Most of the P^{32} separated during the month had to be reprocessed because of precipitate formation at a *p*H of 7 (p. 6).

8. Separation of old fission products from Chalk River Redox waste was completed this month, and the equipment is being altered for processing of Purex waste (p. 6).

9. Design of a metal system to replace the present all-glass tritium apparatus has been started (p. 7).

10. Transfer of radioactive waste metal supernate to the chemical storage pit was completed during the month (p. 9).

11. The beta activity discharged to White Oak Creek was 16.3 curies, compared to 13.9 curies during the previous month (p. 10).

12. The rebuilding of resin cubicle No. 200 was completed with the next RaLa run expected to be made near December 1, 1951 (p. 11).

13. There were 832 radioisotope shipments, compared to 676 last month (p. 13).

PILE DEPARTMENT

OPERATING DATA

	OCTOBER 1951	SEPTEMBER 1951	YEAR TO DATE 1951
Total accumulated kwhr	2,556,832	2,439,476	24,928,237
Average kw per operating hr	3842.17	3724.09	3788.04
Average kw per 24-hr day	3436.60	3388.15	3416.70
Per cent lost time	10.6	9.0	9.8
Excess pile reactivity	105 in-hr	50 in-hr	
Slugs discharged	114	188	3226
Slugs charged	116	199	3343
Product made (g)	93.32	89.03	909.79
Product discharged (g)	2.91	19.03	383.78

PILE OPERATIONS

Graphite Pile. The average pile power per operating hour for the month was 3842.2 kw, compared with 3724.1 kw for September 1951.

The pile-down time was 10.6%, compared with 9.0% in September 1951, and 9.8% for the year to date.

A ruptured slug was detected by visual scanning and discharged on October 29. The data are as follows:

RUPTURE NO.	CHANNEL NO.	DAYS IN PILE	APPROX. TEMPERATURE
91	1773	212	235°C

No Al-Si bonded slugs were canned at Y-12 during October except for a test lot of approximately 550 which were canned with a bronze temperature of 710°C. They were also held in the Al-Si bath for 12 sec instead of 6 sec. These changes, made separately on previous batches, had appeared to reduce the number of blisters obtained when testing the slugs one week at 400°C; however, this lot when tested for one week at 400°C gave 25% rejects caused by blistering. Examination of blistered slugs by the Metallurgy Division showed that some of the blisters were the result of gas, presumably absorbed from the Al-Si bath. Most blisters were the type usually encountered, apparently due to tin contamination.

It is proposed that approximately 1000 slugs which have successfully passed the 400°C test, be tested for several additional weeks at the same temperature. This will give some indication as to the efficiency of the present test. Additional test batches will be prepared at Y-12 from time to time, but for the present no regular production runs will be made.

The canal demineralizer tanks are being shielded with 4 in. of lead. Changes in the piping will permit filtration of large quantities of water through the sand filters with part of the filtered water going to the resin columns and the balance returned to the head of the canal. It is hoped that this will keep the canal water clear (see page 8).

Completion of the three new safety rods is still delayed because of a need for special cables which have not yet arrived.

During the month the increased use of hole 12 made the work at the thermal column tank more difficult since the neutron background in the tank was increased each time the hole was opened. Wooden shields are being built on the north side of the tank and around part of hole 12 to determine whether this will keep the background to a tolerable value.

Responsibility for the operation of a hydrogen liquefier for the research groups has been assumed by the Pile Department. Equipment for this is now set up in a ventilated room in the 3001 storeroom. Runs are now being made on an average of twice a week.

Low Intensity Testing Reactor. The LITR operating data for October in comparison with that of the previous month are shown in Table 1.

The total down time at the LITR was 43.4%, compared with 38.5% in September. The increase was caused mainly by difficulty in getting a thermocouple which would perform satisfactorily between the fuel plates of the reactor. Also, there were 18 unscheduled shutdowns caused by malfunctioning of instruments.

At the request of the Reactor Safeguard Committee, another water drop test was made after operating five days at a power of approximately 375 kw. After shutdown the thermocouples between the plates of fuel element No. 25 reached a maximum temperature of approximately 105°C.

The fuel-element experiment being conducted in HB-2 by the General Electric group has revealed a deficiency in the water system. When water is being taken by the bulk shielding facility, water pressure at the LITR drops to such a low value that the cooling system of the above experiment does not operate properly. A separate or auxiliary water supply will be provided.

The following additional instruments will be provided at the LITR:

1. Water alarm to indicate excess radioactivity in the circulating cooling water.
2. Safety device to indicate a failure of water flow.
3. A safety device to indicate excess water pressure.

TABLE 1

LITR Operating Data for September and October

	OCTOBER 1951	SEPTEMBER 1951
Total accumulated kwhr	258,514	218,068
Average kw per operating hr	613.41	492.59
Average kw per 24-hr day	347.47	302.87
Per cent lost time	43.4	38.5
Position of No. 2 shim rod (in.) (10/29/51)	21.901*	

*The addition of extra fuel elements has made it difficult to compare with September's data.

TABLE 2

Pressure Drop Data

DATE	PRESSURE DROP (inches water gauge)		
	GLASS WOOL	CWS NO. 6	TOTAL ACROSS HOUSE
10-31-51	3.0	1.5	5.8
9-30-51	2.8	1.4	5.5
Clean filters	1.1	1.0	3.3

Two additional fuel elements were added to the LITR loading, making a total of 2696.31 g of U^{235}, of which 27.62 g are estimated to have been consumed. The extra fuel was necessary to compensate for fission products, fuel consumed, and experiments loaded into the reactor recently.

FILTER HOUSE

Table 2 compares the pressure drop across the exit air filters last month with this month and that experienced when all filters were clean.

FAN HOUSE

Both fans operated normally during the month.

The spare 900-hp motor has been repaired and will be installed in place of the No. 2 fan motor.

RADIOISOTOPES

Table 3 is a comparison of the radioisotopes and research samples charged into the pile during October 1951 with those handled in September 1951.

At the end of October 1951, there were 384 cans of target material in stringers 13, 14, and 16, compared with 386 cans of target material in these stringers at the end of September 1951.

TABLE 3

Radioisotope and Research Samples Charged into Pile During September and October

	OCTOBER 1951		SEPTEMBER 1951	
	RESEARCH	RADIOISOTOPES	RESEARCH	RADIOISOTOPES
Stringers 13, 14, and 16	14	129	11	113
Hole 22	52	0	41	0
All other holes	11	33	2	20
Total by Groups	77	162	54	133
Total for Month	239		187	

WATER DEMINERALIZATION BUILDING

The operation of the building was normal with 469,100 gal of water being demineralized, of which 34,050 gal were also deaerated (Table 4).

TABLE 4

Water Demineralized and Deaerated During September and October

PRODUCED (gallons)	SEPTEMBER 1951	OCTOBER 1951	YEAR TO DATE
Demineralized	488,940	469,100	5,850,250
Deaerated	32,175	34,050	470,895

CHEMICAL SEPARATIONS AND RADIOISOTOPE DEVELOPMENT DEPARTMENTS

RADIOISOTOPES

Iodine (I^{131} - 8d). Seventy ORNL slugs were processed and 45,858 mc of iodine were shipped.

Processing difficulties were encountered in two runs this month. One eight-slug run appeared as though the slugs contained a small amount of product; all activity measurements throughout the run were below normal and the yield was only 3 curies instead of the normal 8 curies. In the second run, an off-gas failure occurred in the caustic scrubber causing a high air count in the building.

The analysis on another run produced this month was satisfactory, but after two days' storage developed a dark brown color. The color was removed by distillation.

Four old-type, long-decayed Hanford slugs were dissolved in the iodine equipment for the production of long-lived fission elements.

Iodine Development Work. No further design or experimental work was done on the new iodine plant this month.

Phosphorus (P^{32} - 14.3d). Seventeen 2500-g cans of irradiated sulfur were processed and 10,482 mc shipped.

Throughout this month, it was necessary to reprocess most of the P^{32} products through the glassware due to precipitate formation at a *p*H of 7. The reason for the precipitate formation has not been determined. Each time a run is reprocessed, a high product loss is incurred.

Carbon (C^{14} - 5740y). No C^{14} was separated this month because there was an adequate supply on hand. Some old material was reworked to produce a more homogeneous product.

Carbon Development Work. Analysis of the waste from the Be_3N_2-C^{14} process indicates that the iron and cobalt impurities are responsible for most of the radiation encountered during processing. It was confirmed that Co^{60} is the most important of the activities present. Effort will therefore be made to prepare new target Be_3N_2 as free from cobalt as possible.

Calcium (Ca^{45} - 180d). Normal calcium from the X Pile was processed to yield 14.2 mc at a specific activity of 0.995 mc/g Ca.

Fission Products. A spill which occurred in Bldg. 3030 interrupted operations on purification of fission products. Equipment should be back in operation by November 5.

A total of 1500 mc of Sr^{90} was purified during the month.

Ten curies of mixed fission products made from old HEW slugs are being prepared for Mound Laboratory. Approximately 1.5 curies have been shipped and 5 curies are ready for shipment. This material was neutralized to simulate Savannah Purex wastes. The balance of the order will be shipped when shipping containers are available.

Separation of old fission products from Chalk River Redox waste was completed this month and Tank 14 in the north tank farm was emptied and

washed to be ready to receive Purex waste from the pilot plant about December 1. Part of the ion-exchange equipment which was used for Redox waste is being removed, since such large-capacity columns are not required for Purex. A portion of the first Purex wastes received will be processed by ion exchange to obtain sufficient data for process records, and then the unit will be closed down to permit installation of a precipitation process.

A larger batch-type TBP solvent extractor will be placed in the fission-product cell, Bldg. 3026, in order to process larger quantities of special mixed fission products. This is to satisfy the demand for mixed fission products with a specific, known history.

The final draft of a report on early fission-product separations has been completed.

Fission-Product Development Work. Preliminary chemical work was started on the precipitation process for separating fission products from Purex waste. Table 5 is a summary of the experimental results obtained to date on the first precipitation step in the precipitation process.

A solution of inactive salts of Sr, Ba, Ru, Ce, La, Zr, Mo, and Cs was prepared in the ratio expected from fission of uranium on the basis of 1 g of fission products per liter of solution.

In general, the synthetic fission product mixture was in a 2 *N* HNO_3 solution; about 90% of the acid was neutralized with 45% NaOH; the neutralization was completed with 10% Na_2CO_3 and a small excess added. The precipitate was filtered and the distribution of added activities determined.

Tritium (H^3 - 12y). Design of a metal system to replace the present all-glass tritium apparatus was started. This system will include a uranium trap for storage of the tritium; this will decrease the number of valves required and provide purified tritium at all times for the preparation of thin targets. The metal equipment will eliminate the exchange of tritium with stopcock grease, as well as reduce the possibilities of loss of valuable tritium because of breakage. The quantities of tritium removed from the system will be determined by the pressure drop in a constant volume. The pressure will be measured through a null diaphragm, which will extend the range of measurements and provide constant volume. The pressures can be measured to within a few microns.

Iron (Fe^{59} - 47d) (Fe^{55} - 2.5y). An X-ray source to be used for X-ray diffraction work by a large oil company was prepared by reducing high-specific-activity Fe^{55} (1 curie/g) to the metal and fusing to a platinum strip. The source contained 5 mc of Fe^{55} and had a radiation intensity of 25 mr/hr at contact with a thin-shell cutie pie.

Cobalt oxide, shielded from slow neutrons with cadmium, was placed in the pile to recheck early data on Fe^{59} production; results should be available during December. Forty-five pounds of $CoCl_2$ were obtained from K-25 to be purified by extracting the last traces of iron with dichloroethyl ether; the pure cobalt oxide will be used as target material for the Y-12 cyclotron and pile irradiations.

Two cyclotron copper target cups were plated heavily with purified cobalt metal to be used as targets at Pittsburgh University. This work is a part of the program to secure high-specific-activity Fe^{59}, free of Fe^{55}.

TABLE 5

Experimental Results for Separation of Fission Products from Purex Waste

ACTIVITY ACTIVITY	CARRIER ADDED	ACTIVITY IN PRECIPITATION (%)	ACTIVITY IN FILTRATE (%)
Sr^{89}	250 mg Ba^{++}	97.7	2.3
Ru^{106}	250 mg Ba^{++}	99.88	0.12
Sr^{89}	250 mg Ca^{++}	97.71	2.29
Ru^{106}	250 mg Ca^{++}	94.0	6.0
Cs^{137}	250 mg Ca^{++}	22.4	77.6
Ce^{144}	250 mg Ca^{++}	99.45	0.55
Zr^{95} + Cb^{95}	250 mg Ca^{++}	99.76	0.24
Mixed F.P.	250 mg Ca^{++}	91.37	8.63
Mixed F.P.	None	85.76	14.24

Canal-Water Decontamination Development Work (see page 2). Radiochemical analysis of the canal-water sample concentrate reported last month indicated that almost all of the activity in the canal water is due to Co^{60}. An experimental investigation to determine the most efficient procedure for removing Co^{60} from Dowex 50 resin was made. As a result of this investigation, decontamination of the unit was done as follows:

1. Regeneration with 5% HNO_3.
2. Conditioning with 200 lb $NaNO_3$ (as 3 *M* solution) per column.
3. Conditioning with *p*H 6.0 sodium citrate, using 72 lb citric acid per column, adjusted with NaOH.
4. Conditioning with 100 lb *p*H 6.0 Versene (10% solution) per column.

The radiation intensity at contact with resin column before activity removal treatment was 6000 mr/hr; after treatment it fell to 7 mr/hr. This represents a decontamination efficiency of 99.88%.

The flow rate of demineralized water (approximately 8 gpm) from holes 19 and 51 was found to be insufficient to keep the canal water clear. Filtered water is being admitted to the canal while the decontamination unit changes are being made. When the unit is returned to service, a high flow rate through the canal will be maintained by recirculating a major portion of the water pumped through the sand filters.

Source Preparations. Co^{60} sources were loaded in holders as follows:

1. Southwest Welding & Mfg. Co., 1 source, 800 mc;
2. Tennessee Civil Defense Agency, 1 source, 5 curies;
3. Dowell, Inc., 1 source, 500 mc;

4. Richardson X-ray Service, 2 sources, 1 curie each;

5. Dallas Tank Company, 4 sources, 400 mc each;

6. Office of Civil Defense, Sacramento, Cal., 80 sources, 100 mc each;

7. City of Norfolk, Norfolk, Va., 1 source, 15 mc;

8. USAF School of Aviation Medicine, 6 sources, 50 mc each;

9. Atomic Power Division, Westinghouse, 1 source, 60 mc.

A .1-mc source of Ca^{45} was prepared for the Admiral Corporation.

An Fe^{55} source was prepared for Socony Vacuum Laboratories.

A zirconium-tritium source was prepared for C. D. Moak of the Physics Division.

Packaging. Tritium, 2.40 curies, was packaged for the Bartol Research Foundation.

A ½-mc package of tritium was prepared for W. Hurst, of the Health Physics Division.

Services. A 1-g sample of PCl_3 was prepared for irradiation for Kansas State College.

Cobalt was prepared for irradiation for Los Alamos Scientific Laboratory.

Cobalt was prepared for irradiation for Ohio State University.

Miscellaneous. Work on zinc bromide solution purification was continued. An Alsop filter was fitted with a motor pump unit which worked well with water, but stalled with zinc bromide solution. A gear reducer will be used to overcome this difficulty.

The enriched uranium which was purified from fission products was returned to the Metallurgy Division for their examination and analysis to determine U^{235} burnup.

The coupling between the motor and the blower on the hot off-gas system broke this month, necessitating operation of the steam-driven blower until the coupling was replaced.

TANK FARM

General. The transfer of radioactive metal waste supernate from W-10 to the chemical waste storage pit was resumed on October 1, 1951, and continued through October 3, 1951. In the 24,600 gal of material transferred, there were 18,622 g of uranium, 65 mg of plutonium, and 8.2 curies of beta activity.

Transfer of the chemical waste concentrate from W-8 to the pit was begun on October 3, 1951, and continued through October 5, 1951. This 13,800 gal of waste contained 132.3 curies of beta activity, 8.8 mg of plutonium, and 10,238 g uranium.

The volume of waste in the chemical waste storage pit is decreasing at a rate of 500 to 600 gal per day and the plants near the pit have been found slightly radioactive. The Health Physics Division has the area under its surveillance.

The transfer of metal waste precipitate from tank W-7 to W-10 was begun this month. The material in W-7 was slurried by circulation with a pump and then transferred to W-10. The slurry was then allowed to settle in W-10 and a portion of supernatant returned to W-7 to repeat the procedure. An inspection of the tank by means of an extension light and movable mirrors

showed large deposits of uranium which will necessitate many repetitions of this process to accomplish complete transfer.

Following the repair of several holes in the top of Tank WC-4 caused by jackhammer damage and the relocation of the discharge line to accommodate the float standpipe, the hole was backfilled and the area landscaped. This job is complete except for the painting of the calibration on the gage board and the wiring of the telemetering system.

The installation of the W-12 float, automatic jet controls, and telemetering system has been completed. A leak has developed in the W-12 jet pit in the line from W-12 to W-5. This will be repaired at some future date when the W-12 jet pit is reconditioned to conform with the other jet and valve pits in the tank farm.

An underground water valve at the W-5 pad was found to be leaking into the W-7 drywell and thence to the retention pond. This valve was replaced with a gate valve temporarily until a valve box can be fabricated. The water line to the W-16, W-17, and W-18 jet pit burst because of ground settling in this former excavation. This line was capped and will not be replaced until the ground in this area is given a chance to settle completely.

Wastes Discharged to White Oak Creek. A total of 16.22 curies of beta activity was discharged from the settling basin this month (see Table 6). Several times during the month, higher-than-normal activity was received at the settling basin. This resulted from operational difficulties of the pile canal during the week ending October 7, 1951; a hot spill in Bldg. 3030 which was washed down the floor drains during the week ending October 14, 1951; and a decontamination of the storage canal at Bldg. 3505 during the latter part of the week ending October 21, 1951, and the early part of the week ending October 28, 1951.

Since Bldg. 3019 has been shut down for changeover in equipment, the excessive discharge of water into W-1 and W-2 has ceased. Since the source of this discharge could not be determined in the past, a complete check of all equipment will be made before operation is resumed.

TABLE 6

Activity Discharged to White Oak Creek

DISCHARGED FROM	OCTOBER 1951		SEPTEMBER 1951	
	GALLONS	BETA CURIES	GALLONS	BETA CURIES
Settling Basin	25,500,000	16.22*	26,800,000	13.60
Retention Pond	314,600	0.13	405,000	0.26
Total	25,814,600	16.35	27,205,000	13.86

*Less than 0.625 curie contributed by the evaporator.

Chemical Waste Evaporator (see Table 7). The evaporator was shut down for 16 hr this month to repair two faulty valves. At the same time, a new thermocouple was installed in the condensate stream of condenser No. 4.

TABLE 7

Waste Evaporator Operation

GALLONS FED TO EVAPORATOR	GALLONS OF CONCENTRATE TO W-6	VOLUME REDUCTION	BETA CURIES TO EVAPORATOR	BETA CURIES TO SETTLING BASIN
October				
204,200	26,400*	7.7:1	12,220	0.63
September				
240,700	19,800	12.2:1	10,140	0.34

*430 gal jetted to W-5 because of EV-W6-B valve failure.

Waste Tank Inventory

TABLE 8

Waste Storage

TANKS	GALLONS CAPACITY	OCTOBER FREE SPACE	SEPTEMBER FREE SPACE
HOT-PILOT-PLANT STORAGE			
W-3, 13, 14, 15	48,500	15,700	6,800
CHEMICAL-WASTE STORAGE			
W-5	170,000	98,000	74,000
EVAPORATION-CONCENTRATION STORAGE			
W-6, 8	340,000	113,000	103,500
METAL-WASTE STORAGE			
W-4, 7, 9, 10	543,000	270,500	217,000

RaLa (Ba^{140} - 12.5d)

Except for minor details, the rebuilding of resin cubicle No. 200 has been completed. The new feed tank has been calibrated and a complete check of the other equipment started. The filter disc on the tantalum evaporator was found to be in good condition.

According to Los Alamos, there will be no need to start a run before November 25, 1951. This schedule will allow an adequate amount of time for complete dummy run testing of the equipment.

RADIOISOTOPE CONTROL DEPARTMENT

GENERAL

During October 1951, there were 832 radioisotope shipments, compared with 676 during September 1951, and 760 during October 1950.

The breakdown according to separated, unseparated, project, nonproject, and foreign shipments is shown in Table 9.

Table 9

Radioisotopes Shipments

	OCTOBER 1951	SEPTEMBER 1951	OCTOBER 1950	AUGUST 1946 TO OCTOBER 1951, INCLUSIVE
Separated Material	685	546	592	21,154
Unseparated Material	147	130	168	6,199
Total Shipments	832	676	760	27,353
Nonproject	710	555	579	
Project	117	111	160	
Foreign	5	10	21	
Total Shipments	832	676	760	

HANFORD IRRADIATIONS

The radioisotope samples listed in Table 10 were received from Hanford during October 1951.

TABLE 10

Radioisotope Samples Received from Hanford

SAMPLE NO.	MATERIAL		DATE DISCHARGED	DATE RECEIVED
ORNL-101	Antimony	(2)*	9-18-51	10-2-51
ORNL-118	Tantalum Foil	(1)	9-18-51	10-23-51
ORNL-130	Enriched Fe^{54}	(1)	9-18-51	10-23-51
ORNL-60	KCl	(2)	9-24-51	10-23-51
ORNL-28	Fe	(2)	9-18-51	10-23-51
ORNL-101	Antimony	(4)	Oct. '51	10-25-51

*Number of pieces.

CYCLOTRON RADIOISOTOPES

Table 11 lists the outstanding orders for cyclotron radioisotopes now on hand. See also Tables 12 and 13.

TABLE 11

Cyclotron Radioisotopes Orders

MATERIAL	AMOUNT (millicuries)	STATUS
Be^{7}	5	Material in process
Na^{22}	12.2	Material has been requested
Mn^{54}	9.0	Material in process
Co^{57}	5.0	Material in process
Fe^{59}	71.75	Material has been requested

TABLE 12

Bombardments Received and Requested

MATERIAL	MASS. INSTITUTE OF TECHNOLOGY		UNIVERSITY OF CALIFORNIA		UNIVERSITY OF PITTSBURGH		WASHINGTON UNIVERSITY	
	BOMBARD-MENTS	BEAM HOURS	BOMBARD-MENTS	BEAM HOURS	BOMBARD-MENTS	BEAM HOURS	BOMBARD-MENTS	BEAM HOURS
Bombardments Received								
Be^{7}			1	47.2	11	297.5		
Na^{22}	2	190.00			6	216.75	4	300.00
Mn^{52}					2	20.00		
Mn^{54}	1	50.00					4	200.00
Co^{57}	1	10.00					3	100.00
Fe^{59}			7	332.8	1	40.00	1	34.00
Zn^{65}	1	100.00	1	47.80				
Sr^{85}	2	59.75			1	10.00		
As^{73}					2	20.5		
I^{125}							2	60.00
Mo					2	15.7	3	30.00
S					1	2.00		
Ga^{67}					3	15.15		
Total Received	7	409.75	9	427.80	29	637.60	17	724.00

TABLE 12 (cont'd)

			Requested But Not Received					
Ti^{46}			1	3.00				
Ti^{48}			1	3.00				
Fe^{54}			1	3.00				
Fe^{57}			1	3.00				
Fe^{59}					1	40.00		
Ga^{67}					7	56.00		
Total Hours Outstanding (Not Received or Requested)		1,090.25		1,060.20		766.40		776.00

TABLE 13

Shipments of Cyclotron-Processed Radioisotopes

MATERIAL	NO. SHIPMENTS OCTOBER 1951	NO. MILLICURIES OCTOBER 1951	NO. MILLICURIES TO DATE
Be^{7}	1	1 S.I.*	237.293 and 1 S.I.
Na^{22}			49.763
Mn^{52}			9.991
Co^{57}			3.1
Fe^{59}	2	2 S.I.	2.64 mc and 4 S.I.
Zn^{65}	1	1 S.I.	35 mc and 4 S.I.
Mn^{54}			2.72
$Fe^{55,59}$			61
As^{73}			0.650
Sr^{85}			6
Mo^{95}	1	1 S.I.	1 S.I.

*Service irradiation.

ACTIVATION ANALYSES

Work continues on samples for several companies and additional work is being done on a price list for activation analysis.

SF MATERIAL CONTROL

1. During October an additional 536 Al-Si bonded slugs were received from Y-12 for testing and subsequent loading into the 3001 pile.

2. On October 30, 1951, two foils of enriched uranium metal were received from J. E. Cunningham, 4.5860 g, 90.1 to 95% enriched, for shipment to KAPL on their requests SR-SNY-361 and SR-SNY-365. These foils are expected to be shipped within the next week.

3. On October 1, 1951, two thorium billets totaling 91.78 kg were received. This material is for use by the Metallurgy Division and is to serve as partial replacement for approximately 1 ton of thorium billets and scrap shipped to Tonawanda Area and Ames Laboratory at the request of the USAEC.

4. On October 8, 1951, seventeen thorium billets totaling 102.51 kg were received from USAEC, Tonawanda Sub-Office, Kenmore, New York. This material was returned at the request of ORNL Metallurgy Division when informed by Tonawanda Area USAEC that it was unsuitable for the proposed USAEC usage.

5. The audit of SF accountability records and review of procedures at ORNL by personnel from the USAEC, ORO SF Accountability Branch, were completed during the first week of October.

6. SF surveys during the month consisted of visiting five persons possessing SF material. Material in their possession was inspected and weighed where feasible. No apparent discrepancies were encountered.

7. Records of three analytical laboratories were audited. Results of the audit disclosed that all records were in good order and proper accounting had been made for all samples.

8. During the month there were 24 receipts and 20 outgoing shipments, compared with 21 receipts and 14 shipments last month.

9. Tables 14 and 15 are summaries of receipts and shipments of SF material for the month of October 1951.

TABLE 14

Receipts

FROM	MATERIAL	AMOUNT (grams)
Argonne National Laboratory	Normal uranium (slugs)	38,580.00
Battelle Memorial Institute	Thorium (crystal bar)	380.00
Battelle Memorial Institute	Thorium (crystal bar)	320.00
C&CCC, Y-12 Area	Enriched uranium (U-nitrate)	0.10
C&CCC, Y-12 Area	Enriched uranium (UF_4)	0.50
C&CCC, Y-12 Area	Enriched uranium (metal)	94.31
C&CCC, Y-12 Area	Enriched uranium (Ni sleeves)	0.21
C&CCC, Y-12 Area	Enriched uranium (UF_4)	0.25
C&CCC, Y-12 Area	Normal uranium (U-Zr)	53.40
C&CCC, Y-12 Area	Normal uranium (compounds)	146.80
C&CCC, Y-12 Area	Depleted uranium (U_3O_8)	1.00
C&CCC, Y-12 Area	Normal uranium (UF_4)	54.20
C&CCC, Y-12 Area	Normal uranium (slugs) net	646,200.00
C&CCC, Y-12 Area	Normal uranium (oxide)	578.90
C&CCC, Y-12 Area	Normal uranium (UF_4)	326.00
C&CCC, Y-12 Area	Normal uranium (UF_4)	0.27
E. I. duPont de Nemours & Co.	Normal uranium (fission chambers)	100.00
General Electric Co.-AGT	Enriched uranium (UO_2)	0.1191
General Electric Co.-AGT	Enriched uranium (UO_2	0.5490
General Electric Co.-AGT	Normal uranium (fuel plates)	108.80
General Electric Co.-HGE	Normal uranium (slugs)	266,710.92
General Electric Co.-HGE	Thorium (slugs)	1,646.53
Iowa State College	Thorium (billets)	91,780.00
USAEC, Tonawanda Sub Office	Thorium (billets)	102,511.34

TABLE 15

Shipments

TO	MATERIAL	AMOUNT (grams)
C&CCC, K-25 Area	Normal uranium (Purex)	98,429.03
C&CCC, Y-12 Area	Normal uranium (UO_2SO_4)	520.00
C&CCC, Y-12 Area	Enriched uranium (MTR)	4.13
C&CCC, Y-12 Area	Normal uranium (compounds)	54.41
C&CCC, Y-12 Area	Enriched uranium (U_3O_8)	0.094
C&CCC, Y-12 Area	Enriched uranium (MTR)	6.43
C&CCC, Y-12 Area	Normal uranium (UNH)	109,525.21
C&CCC, Y-12 Area	Enriched uranium (MTR)	0.36
C&CCC, Y-12 Area	Enriched uranium (MTR)	0.35
C&CCC, Y-12 Area	Normal uranium (UNH)	67,501.09
C&CCC, Y-12 Area	Normal uranium (bar)	525.00
C&CCC, Y-12 Area	Depleted uranium (Purex)	8.61
C&CCC, Y-12 Area	Enriched uranium (U_3O_8)	13.72
C&CCC, Y-12 Area	Enriched uranium (MTR)	202.17
C&CCC, Y-12 Area	Normal uranium (U-alloy)	6,410.00
C&CCC, Y-12 Area	Enriched uranium (MTR)	4.72
C&CCC, Y-12 Area	Normal uranium (bar)	2,500.00
Los Alamos Scientific Laboratory	Plutonium (Purex)	104.90
University of Calif. Rad. Lab.	Thorium (wire)	71.28
USAEC, Idaho Operations Office	Normal uranium (fuel assemblies)	700.00