ORNL-501
SERIES A:
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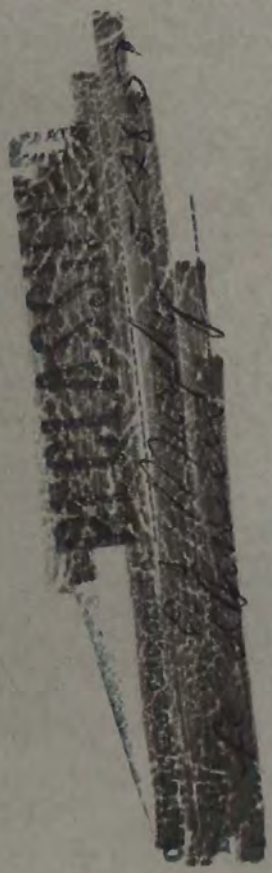

OPERATIONS DIVISION

MONTHLY REPORT
FOR
MONTH ENDING OCTOBER 31, 1949

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OAK RIDGE NATIONAL LABORATORY
OPERATED BY
CARBIDE AND CARBON CHEMICALS CORPORATION
FOR THE
ATOMIC ENERGY COMMISSION

OAK RIDGE, TENNESSEE

SECRET

REPORT NUMBER: ORNL-501

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OPERATIONS DIVISION

MONTHLY REPORT

for

Month Ending October 31, 1949

by

M. E. Ramsey
E. J. Witkowski
A. F. Rupp
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O A K R I D G E N A T I O N A L L A B O R A T O R Y

operated by
Carbide and Carbon Chemicals Corporation
for the
Atomic Energy Commission
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Oak Ridge, Tennessee

SUMMARY ORNL-501

1. The pile-down time averaged 12.0% for the month compared with 8.3% for September, 1949. (Page 5.)
2. Two ruptured slugs were detected and discharged during the month. (Pages 5 and 6.)
3. The excess pile reactivity remained constant at 130 to 140 inhours during the month. (Page 6.)
4. The construction of the 105-205 change house and replacement of the south balconies are progressing satisfactorily. (Page 6.)
5. The bearings on both fans had to be replaced during the month. (Page 7.)
6. Hanford-exposed slugs were used to produce thirty-eight curies of I^{131}. (Page 9.)
7. The temporary P^{32} equipment located in the Tank Farm and Building 204 is operating satisfactorily. (Pages 9, 10, and 11.)
8. Fission product separations using Hanford-irradiated metal were started. (Pages 12 and 13.)
9. Cyclotron-produced Na^{22} and Be^{7} were separated and shipped on outstanding orders. (Page 14.)
10. All metal waste stored in Tank W-8 (Tank Farm) was transferred to W-10 so that additional chemical waste storage space is now available. (Page 15.)
11. RaLa Run #36, measuring about 4,300 curies, was produced and shipped without difficulty. (Pages 19 and 20.)
12. There were 496 radioisotope shipments during October, an increase of 12% over last month. This brings the total number of shipments to 10,380 since the start of the Radioisotope Program in 1946. (Page 21.)

SUMMARY - (Continued) ORNL-501

13. Inhour restrictions for Special Request samples in the Hanford pile threaten to limit the supply of Co^{60}, C^{14}, and P^{32}. (Pages 21 and 22.)

14. The Radioisotope Area was completed except for minor adjustments to equipment and installation of high pressure blowers and electrical precipitators. Laboratory personnel started the installation of remote control equipment and instruments. (Page 23.)

15. Comments on S-F accountability are included in this report to eliminate the quarterly reports previously issued. (Pages 24, 25, 26, 27, and 28.)

A. PILE DEPARTMENT

I. Operating Data:

	OCTOBER 1949	SEPTEMBER 1949	YEAR-TO-DATE 1949
Total Accumulated KWH	2,112,164	2,290,313	24,323,489
Average KW/operating hour	3225.18	3470.51	3682.76
Average KW/24-hour day	2838.93	3180.99	3333.81
Percent Lost Time	12.0%	8.3%	9.5%
Approx. Excess Pile Reactivity	130-140 inhours	130-140 inhours	
Slugs Charged	400	131	2931
Slugs Discharged	400	114	2864
Product Made (grams)	77.09	83.59	860.72
Product Discharged (grams)	22.51	4.64	215.92

II. Pile Operation:

The pile-down time averaged 12.0% compared to 9.5% for the year-to-date. This increase in pile-down time was due to failure of the water pump for the fuel assembly evaluation experiment at Hole 11 and shutdown time necessary in preparation for the permanentization of the south experimental levels.

The fuel assembly in Hole 11, being evaluated by Argonne National Laboratory, has continued to operate without difficulty except for a cooling water pump failure on October 6, 1949.

Two ruptured slugs were located by visual inspection and discharged during the month. Some difficulty was encountered in discharging row 1479 since the slug was about 70% oxidized. Visual inspection indicated that the channel was completely closed. It required about three hours' work to discharge the slug. The graphite in the channel was not damaged. The ruptured slugs gave no interpretable indication of their presence on the probe. These ruptures have brought the total to sixty-three since the pile was put in operation during November, 1943.

II. Pile Operation: (Continued)

These ruptured slugs were exposed as follows:

Metal Channel No.	Date Discharged	Days in Pile	Approx. Max. Temp.
2672	10-17-49	1868	145°C
1479	10-17-49	1822	145°C

The excess pile reactivity remained constant at 130 to 140 inhours during the month.

The average pile power per operating hour of 3225.18 KW is about 250 KW below last month due to operation at approximately one half pile power during the two fan bearing changes that were made this month.

The construction of the change house and locker room west of the Pile Building and north of the core annex is progressing satisfactorily. The structural steel has been erected, the floors poured, and the major portion of the walls erected.

Work on the steel and concrete experimental levels on the south side of the pile is slightly ahead of schedule. The last major pouring of concrete was made on October 28, with practically all of the forms having been removed by the end of the month. The removal and installation of samples for isotope production was accomplished with no appreciable difficulty by use of a temporary balcony during the early phase of construction. The second level, south, face balcony has been rebuilt and was used in the normal fashion for isotope insertion and removal at the end of the month.

III. Filter House:

The following table compares the pressure drop across the exhaust air filters of last month and this month with that experienced immediately after replacement of filters:

	F.G. #50 GLASS WOOL FILTERS		C. W. S. #6 PAPER		ACROSS HOUSE	
Date	Inches w.g.	% Increase	Inches w.g.	% Increase	Inches w.g.	% Increase
Clean filters	1.1	--	1.0	--	3.3	--
9-30-49	3.9	254	2.0	100	7.2	118
10-31-49	4.0	3	2.1	5	7.4	3

Filter House operation was normal during the month.

IV. Fan Operation:

The bearings failed on No. 3 Fan and were replaced on October 12, 1949. The south bearing had a damaged race and a chipped ball. These bearings had been in service since November 2, 1948.

The bearings were changed on No. 2 Fan on October 25, 1949, due to failure. Several marked balls were found in the north bearing due to a bad race. These bearings were installed on June 15, 1949.

Except for the two bearing failures, Fan House operation was normal during the month.

V. Radioisotopes:

The following table is a comparison of the radioisotope and research samples charged into the pile during October, 1949, with those handled in September, 1949:

[redacted]

V. Radioisotopes: (Continued)

	SEPTEMBER, 1949		OCTOBER, 1949	
	Research	Radioisotopes	Research	Radioisotopes
Stringers 13, 14, and 16	5	88	11	99
Hole 22 (Pneumatic Tube)	32	5	1	6
All Other Holes	5	17	45	25
TOTAL BY GROUPS	42	110	57	130
TOTAL FOR MONTH	152		187	

At the end of October, 1949, there were 385 cans of target material in Stringers 13, 14, and 16, compared to 358 cans of target material in these stringers at the end of September, 1949.

B. CHEMICAL SEPARATIONS AND ISOTOPE DEVELOPMENT DEPARTMENTS

I. Radioisotopes:

1. Iodine (I^{131} - 8d)

Eleven ORNL slugs and two Hanford slugs were processed and 19,895 millicuries shipped. All products were within specifications.

Approximately 38 curies of I^{131} were produced from the two Hanford slugs. This was three curies more than was made in the first Hanford-slug run, and provided enough I^{131} for approximately three weeks. No unusual radiation hazards were experienced during the run.

During the two-week shutdown period following the Hanford-slug run, the cell was decontaminated and the following repair work done:

a. Three ionization chambers were replaced.

b. A polythene coupling in the dissolver sampler line was replaced.

c. A leak in the UNH transfer line was repaired.

2. Phosphorus (P^{32} - 14.3d)

The emergency P^{32} equipment in the Tank Farm (extraction) and Building 204 (purification) was put into operation. The extraction equipment is performing quite well with consistently high yields and comparatively pure extracts are being obtained, low in iron and other inorganic contaminants. However, a relatively large amount of organic matter is still being extracted out of the sulfur and is a source of trouble in the subsequent purification operations.

2. Phosphorus (P^{32} - 14.3d) - (Continued)

Data on several runs are given below:

Run #	Can #	mc P^{32} First Extraction	mc P^{32} Second Extraction	mc P^{32} Total	mc P^{32} Product	Yield
204-1,2	247	510	---			
	248	891	---			
	249	586	149			
	250	697	28	2861	2633	92%
204-3	251	473	100			
	252	369	233			
	253	412	73			
	254	629	162	2451	1952	80%
204-4	255	924	*			
	256	942	*			
	257	587	*			
	258	524	*	2977	2060	69%

* Analytical results incomplete; second extraction will be processed separately.

Several portions of waste from various steps in Runs 204-3 and 204-4 were re-worked to produce carrier-free P^{32} for special orders.

Cans #257 and #258 were B&A flowers of sulfur and the extracts were the best yet seen, being water-white in contrast to the yellow-brown extracts obtained from City Chemical sulfur. However, the B&A flowers extract still contains an undesirable amount of organic matter and metallic impurities.

The use of fluorothene precipitation vessels, fluorothene-asbestos filters, Vycor evaporation vessels, and polythene and fluorothene lines has reduced the amount of silica picked up during processing.

It was observed that fairly serious losses of P^{32} are suffered during HNO_3-HCl fuming operations to oxidize and destroy organic matter. However, total solids in the product

2. Phosphorus (P^{32} - 14.3d) - (Continued)

remain high (7 mg/ml vs. specifications of 1 mg/ml) if this step is omitted. Methods are being sought to salvage this loss. As a more long-range curative measure, plans are being made to purify our own sulfur for target material.

Thirty Hanford slugs were filled with sulfur and sent to Hanford for irradiation. Ten, irradiated sulfur slugs are scheduled back from Hanford in about two weeks.

Three, Hanford-irradiated P_2O_5 tubes were processed during the month yielding approximately 2,500 millicuries of P^{32} to supplement our supply from sulfur.

Four shipping containers, with four-inch lead shielding, designed for transporting six-inch Hanford slugs were designed, fabricated, and sent to Hanford. One of the uses for these containers is to ship irradiated sulfur slugs.

The design for sulfur extraction equipment to be installed in the new Isotope Area is approximately 80% complete. All glass-lined parts have now been received from the Pfaudler Company.

3. Carbon (C^{14} - 5100y) - Be_3N_2 Process

Work continued on preparation of the report on the Be_3N_2-C^{14} process and design of equipment for isolating and studying the organic components of the C^{14} gases was started.

4. Sulfur (S^{35} - 87d)

None produced; adequate supply in stock.

[redacted]

5. Fission Products

Run SS-18 was finished early in the month. The Zr-Cb cuts obtained were a blue-green color as a result of radiation decomposition of the anion resin (Dowex A) in column #1A; the top of this column showed a dark brown region of decomposition. As we have pointed out before in our reports on P^{32} work, anion ion exchange resin is apparently unstable in high radiation fields.

Run SS-19 was started October 17, 1949, and is still in progress on October 31, 1949. Starting material was the UNH from the Hanford slugs dissolved for I^{131} production. Head tank analysis showed approximately 760 curies of fission product activity present, which overtaxed the shielding of the cell at certain points. About 40 curies each of the various important fission products will be obtained from this run.

The Zr-Cb was stripped from this material by our old method, absorption on IR-1 resin, washing thoroughly with 0.25 M H_2SO_4, followed by elution of the Zr-Cb with warm 0.5 M oxalic acid. A good yield ($\sim$40 curies) was obtained.

Anion activities were also separated. The column #2 effluent was allowed to collect until uranium breakthrough (seven liters) and this was boiled down to near-dryness in the evaporator. This material was taken up in water and passed through a small cation resin column. In spite of this treatment, a small amount of U and Pu persisted in the product.

[redacted]

5. Fission Products - (Continued)

Since it will probably be unnecessary to run the fission product equipment to obtain the short-lived activity group for many months, old (three-year) Hanford and "X" slugs will be processed for the next few months to build up a stock of Cs, Sr, 61, 43, and possibly Eu and Sm.

a. Zr^{95} - Cb^{95} (Zr^{95}-65d, Cb^{95}-35d)

Approximately 40 curies were produced during the month. About 15 curies of this material were taken out of storage and put into the TTA extraction equipment to milk the Cb^{95} off to fill some orders for this material. There are no outstanding orders for Zr-Cb.

b. Cs^{137} - 33y

About 25 millicuries of Cs^{137} are in process. The alpha is slightly above specifications of 200 counts per mc Cs^{137}. The batch is being re-worked to reduce the Pu content.

c. Ce^{144} - 275d

Approximately one curie of Ce^{144} (from old stock) was purified during the month.

d. Sr^{90} - 30y

About 80 millicuries of Sr^{90} were purified by mercury cathode electrolysis (to remove metallic impurities) and ion exchange conversion to the chloride. The balance of the Sr^{90} batch (~2 curies) will be worked up by this method during November, 1949.

6. Ruthenium (Ru^{106} - 1y)

A better set-up was made for electroplating Ru sources, since a fairly large source (125 mc) must be prepared. After the test runs are completed satisfactorily, this large source will be made.

Preparations are being made for distilling more Ru from Tank Farm waste (stored in ferrous hydroxide slurry) to rebuild the Ru^{106} stock.

A special order of Ru^{103} will be made from F. P. Run #SS-19 tailings.

7. Calcium (Ca^{45} - 180d)

There are adequate supplies of most grades of Ca^{45} preparations on hand, with the exception of carrier-free material. Further separations of Ca^{45} from scandium is awaiting the set-up of heavily-shielded equipment in the new area.

8. Iron (Fe^{55-59} - 4y, 44d)

Samples of normal iron were sent to Hanford for irradiation. A sample of enriched Fe^{58} is also to be sent in the near future. No chemical preparations were made.

9. Cyclotron Targets

a. Sodium (Na^{22})

Approximately 0.4 mc of Na^{22} was prepared and shipped.

b. Beryllium (Be^{7})

The test target (lithium) for Be^{7} was processed; 0.627 mc of Be^{7} was recovered and shipped in an isotonic salt solution.

10. Miscellaneous

a. Strontium Sources

Five special Sr^{90} sources, ranging from 1 to 5 mc each, were prepared and shipped for use in beta-ray thickness gages.

b. Silver (Ag^{110} - 225d)

An irradiation unit of Ag^{110} was prepared as nitrate solution to be dispensed on a volume basis.

II. Tank Farm and Burial Ground:

1. General

a. Tank W-8 was added to the evaporator concentrate storage system by pumping the last 20,400 gallons of metal waste from W-8 to W-10 and W-9 and then washing it out with a fire hose. Approximately 57,600 gallons of the concentrated solution from W-6 were then transferred to W-8. After settling, this material will be reconcentrated by again processing it through the evaporator.

b. A total of 4,760 gallons of 50% liquid caustic was added to W-10 tank to precipitate the uranium. After settling, the supernate will be jetted to the Chemical Waste System.

c. A spill of contaminated water occurred at the vent in the waste line from 706-C and 706-D. It was found, after the pipe was uncovered, that it was caused by a leak in the main line; the water rose to the surface through the vent. The line was repaired and the vent removed since it no longer served any useful purpose.

d. Approximately 2,400 gallons of precipitated metal supernate were jetted from W-7 tank to the Chemical Waste System.

2. Wastes Discharged to the White Oak Creek

Approximately 32.04 curies of beta activity were discharged from the Settling Basin this month. This discharge includes the evaporated waste from a 706-D run made during the month.

The Retention Pond discharged 2.67 curies of beta activity during the week of 10/16-10/22/49. This activity came from an unknown source; all the underground tank drywells were checked and no activity of this magnitude was discovered. The only possible explanation seems to be that the activity was discharged to a drywell without notifying the supervisor in charge of the Tank Farm.

The following table shows the discharge of activity to the White Oak Creek:

Discharged From	Gallons	Curies
Settling Basin	29,049,000	32.04
Retention Pond	351,000	2.78

3. Waste Evaporator

Good volume reductions were obtained this month due to low specific gravity feed solutions. On one run, a volume reduction of 86.5:1 was reached.

During the month the following changes were made on the evaporator:

a. Dampers were installed on the evaporator liquid level lines in an effort to stop fluctuations in the instrument pen. [redacted]

3. Waste Evaporator - (Continued)

b. A spray nozzle was installed inside the top of the evaporator to spray about .5 ppm of water directly on top of the boiling liquid in an attempt to reduce the frequency of foam-overs. In two subsequent runs, the foaming-over tendency was materially reduced, but not completely stopped.

c. A valve from the evaporator to W-6 was repaired.

d. A condenser thermocouple was replaced.

e. Several service valves were repacked and one replaced.

f. All steam traps on the evaporator were removed and inspected.

Gallons Fed to Evaporator	Gallons of Concentrate to W-6	Volume Reduction	Beta Curies To Evaporator	Beta Curies to Settling Basin
245,140	8,276	28.6:1	717.97	20.85

4. Waste Tank Inventory

Tanks	Gallons Capacity	Gallons In	Gallons Out	Discharged To	Free Space
HOT PILOT PLANT STORAGE					
W-3	41,300	2,664	--	--	10,064
CHEMICAL WASTE STORAGE					
W-5	170,000	228,659	245,140	Evaporator	37,200
EVAPORATOR CONCENTRATE STORAGE					
W-6	170,000	10,675	57,600	W-8	76,800
W-8	170,000	69,600	20,400	W-9 and W-10	100,800
METAL WASTE STORAGE					
W-4,7,8 9,10	543,000	11,964	2,400	W-5	31,408

5. Special Wastes

a. A shipment of trash from Ames, Iowa, was buried.

b. A shipment of waste from Y-12 was buried.

c. Four shipments from Dayton were buried.

d. Two pots and six drums of uranium-plutonium waste were received from Chicago.

e. A total of 314,634.20 grams of uranium was transferred to the Metal Storage System this month. Of this, 706-D Building transferred 129,831.62 grams; the Technical Division, Section I, 183,859.58 grams; the Technical Division, Section IV, 328 grams; and the Hot Pilot Plant, 615 grams.

f. About 220 gallons of weak uranium waste were received from K-25.

[redacted]

III. RaLa (Ba^{140} - 12.5d):

The decontamination of Cell A proceeded satisfactorily and the repair of the A-9 agitator bearing was completed early in the month.

RaLa Run #36 was started on October 9, 1949, as scheduled with the loading of seventy-four Hanford, four-inch slugs to the dissolver. The slugs were dissolved and extracted in two batches. With the exception of air contamination which occurred twice during the run, once at the start of the final product volume reduction in B-6 tank and once at the time of sampling of the fuming nitric waste, no operational difficulties were encountered. The waste losses were unusually low. The glassware operation was slightly longer than it was for the past two runs due to slower filtrations.

L.S.T. was reached on October 13, 1949, at 1745. The product was shipped at 0845 on October 14, 1949, as a nitrate with a content of 4,275 curies as determined by an 11¼-hour skyshine measurement of 42R. This was the second largest run ever shipped.

The analytical summary of the run follows:

Slugs Loaded: 74 - 4" Hanford slugs
Slugs Dissolved: 75.4 - Hanford slugs (by analysis)

	Curies	Percent
Total Curies Dissolved	5,893	100.00
Cell A Losses	1,043	17.70
Cell B Losses	526	8.93
Losses Accounted For	1,569	26.63
Material Balance through B-6		86.88
Product Shipped (Skyshine)	4,275	72.54
Material Balance through Skyshine		99.17
Losses Unaccounted For		.83

III. RaLa (Ba^{140} - 12.5d): - (Continued)

The discrepancy between the radiochemical results and skyshine results is due undoubtedly to inaccuracies in determining volumes. At the time of product analysis in B-6 tank, the solution volumes are very small and the curies per milliliter content are extremely high. An inaccurate tank reading or calibration produces a large error in final product calculation.

Los Alamos reported sufficient quantity of RaLa Run #36 despite a low yield on its first "milking".

A new bottom plate was welded onto one Phoenix carrier when a bottom weld was found to be leaking. Attempts to repair the old weld were not successful.

RaLa Run #37 is scheduled to start on November 20, 1949.

C. ISOTOPE CONTROL DEPARTMENT

I. General:

There were 496 isotope shipments during the month compared with 441 during September.

A breakdown of shipments according to separated and unseparated material is as follows:

	SEPTEMBER 1949	OCTOBER 1949	TOTAL August, 1946, to October, 1949, Inc.
Separated Material 706-D Area	338	398	7,967
Unseparated Material 100 Area	103	108	2,413
	441	496	10,380

A breakdown of shipments according to non-project, project, and foreign shipments for September and October is as follows:

	SEPTEMBER	OCTOBER
Non-Project	347	389
Project	68	91
Foreign	26	16
	441	496

II. Phosphorus:

All outstanding orders for P^{32} were filled during the month with more than nine curies being shipped.

III. Hanford Exposures:

The restriction on inhours in the Hanford pile threatens to limit the supply of Co^{60}, C^{14}, and other miscellaneous radio-isotopes.

At the present rate of demand the 2,000 curies of Co^{60} on hand or at Hanford will be exhausted within six to eight months. Since a specific activity of 2 to 3 C/gm is essential in many large sources, at least a year's Hanford exposure is necessary.

III. Hanford Exposures: - (Continued)

To meet the continuing demand for Co^{60}, additional material must be loaded in the Hanford piles as soon as possible.

Sufficient C^{14} is on hand for the next eight to ten months. However, Be_3N_2 slugs must be loaded in the Hanford piles immediately if the anticipated demands are to be met.

The ORNL pile can supply enough P^{32} to provide about 10 C/month. The increased demands for this material will soon exceed this amount. The exposure of sulfur in the Hanford piles will be essential if the program is not to be limited.

IV. Beta Ray Sources:

The demand for beta ray sources of both Strontium 90 and Ruthenium 106 continues to increase. Strontium 90 sources have been requested by the General Electric Company and the Kelley Koett Company for use in beta ray thickness gauges. Ruthenium sources have been requested by the University of Illinois Medical School and Western Reserve Medical School. The first of these will be used to irradiate the inside of the stomach to reduce acid secretion in ulcer cases and the second to supply beta radiation to tumors.

V. Cyclotron Isotopes:

The first Sodium 22 and Beryllium 7 produced under the cyclotron program were shipped this month. Approximately seven orders are on hand for Beryllium 7, Iron 59, Zinc 65, Sodium 22, and Iodine 125. These orders will be filled within the next few months.

[redacted]

[redacted]

VI. Radioisotope Processing Area:

In the Isotope Processing Area, construction work was completed on the processing buildings and with several minor exceptions the buildings were turned over to the Operations Division on October 21, 1949. At the exhaust stack, installation of the exhaust duct to the Isotope Area and to Buildings 706-C and 706-D was completed, except for painting and tying-in to the buildings. Installation of the filters for the cell exhaust system was started. Also, the pad was poured for the electrical precipitators for the hot off-gas system.

Installation of the remote control isotope packing equipment in the Analytical Building was started by ORNL personnel.

L. B. Emlet, Director
Operations Division

wp

[redacted]

VII. SF Material Control:

1. In the August report it was mentioned that 65% of the enriched uranium above 75% enrichment in possession of the Laboratory was transferred to the Y-12 Plant for recovery. On October 7, 1949, data from the Y-12 recovery operation indicated the possibility of an "unaccounted for" loss of material. The Atomic Energy Commission was promptly notified and a thorough investigation was started. The result of this study indicated that 72.33 grams were unaccounted for, but since the limit of error was +/- 75 grams, the difference could not be considered significant. This information was conveyed to the Commission at a meeting held October 17, 1949, in Dr. A. H. Holland's office between members of the Production, and Research and Medicine Divisions of the Atomic Energy Commission, and representatives of the Laboratory. Further, the information was formalized in a letter to Dr. A. H. Holland from Mr. C. N. Rucker, dated October 18, 1949. At this writing the material has been returned to the Laboratory and is now being processed for the preparation of fuel assemblies to be used in the Materials Testing Reactor work.

2. In the September Accountability Report, issued in October, a large gain of plutonium and depleted uranium was shown as a result of reversing charge-off losses reported in June, July, and August on Account Code 311, Chemical Waste System. Due to the installation of an evaporator June 1, 1949, it has been decided that material should not be considered as lost when going to the Chemical Waste System provided the

VII. SF Material Control: - (Continued)

2. Tank Farm Supervisor is properly notified in advance so that pipe line valves can be adjusted for receiving such material.

It should be pointed out that this material is of an inferior quality since it is mixed with large quantities of solid material chemically impure.

3. Two shipments were received from Hanford, the first containing material for the RaLa process and the second containing 200 gallons of supernate for the tributyl-phosphate process directed by the Semi-Works Group of the Technical Division. This brings the total material received for this process to 400 gallons. There will definitely be one, and possibly two more receipts of 200 gallons each of this material for this purpose.

4. Due to the quantity and high enrichment of the material covered by Request 52, the Accountability Office established, in addition to its normal accounting procedures, special subsidiary accounts to provide continuous material balances for the processing of this material. These accounts consist of a ledger sheet for each run, of which there will be a total of seven, and each sheet will reflect analytical results for the key sampling points of both the first and second cycle processes.

After completion of all runs, a sample will be taken of the product for transmittal to Y-12 for a U^{235} and U^{236} assay. It is expected that this procedure will enable us to maintain records of reasonable accuracy of this work; however, the

VII. SF Material Control: - (Continued)

4. figures reflected in these records can only be literally accepted when analytical and process limits of error are applied.

5. A letter was issued by the Laboratory Director to all research directors requesting that each division submit to the Accountability Office their requirements for special materials for the next three years. This letter was the result of a GM Regulation received from the Atomic Energy Commission directing the contractors to submit this information in order that they might formulate a picture of the long-range needs of these materials. Further, it appears that this information is desirable to the AEC since some of the material involved will not be available through the usual commercial channels in sufficient quantities except at prohibitive prices, and will also assist them in determining where it is advantageous to undertake to support the development or production effort of these materials.

6. The SF Material Transfer Form--X-150 and the SF Inventory Form--M-66-A are currently being revised to provide for more detailed information needed by the Accountability Office for an expeditious preparation of the monthly report. These forms, together with appendages, will be distributed approximately December 1, 1949, to all persons handling SF materials. Both forms are being pre-numbered and a record will be maintained by the Accountability Office of the series of forms assigned to each individual. This is necessary since arrangements have been completed with the Security Division for each

VII. SF Material Control: - (Continued)

6. person using these forms to document their own papers, using the form number in the upper left hand corner together with the serial number in the upper right hand corner as a Central Files number instead of routing the documents through Central Files for a number to be assigned, as has been the procedure in the past. All that will be required is that the originator indicate on the receipt for the document the number that he is assigning to the document, and forward the necessary copies of the receipt to Central Files.

7. It should be pointed out that there has been a marked improvement in the date of submission of inventory reports by persons handling SF materials. This cooperation was a big factor in assisting the Accountability Office to submit their last monthly report at an early date.

8. Following is a summary of shipments and receipts of SF materials for the month of October, 1949:

SHIPMENTS

Shipped To	Material	Content
Argonne National Lab.	Depleted Uranium and Plutonium	8.25 gm. .000002 gm. Pu
Brookhaven National Lab.	Thorium Fluoride Pellets	38.58 gm.
C&CCC, K-25 Area	Normal Uranium Slugs	3,550.00 gm.
" " "	"W" Size Slug (Normal)	3,550.00 gm.
" " "	One Hot Slug (Depleted)	986.30 gm. .12 gm. Pu
" " "	One "X" Size Slug (Normal)	1,166.00 gm.
C&CCC, Y-12 Area	Normal Uranium	3,487.00 gm.
New York Operations	Plutonium Alpha Discs	0.30 mg. Pu
Westinghouse	Uranium Metal and Uranium Beryllium Metal Mixture	15.40 gm.

VII. SF Material Control: - (Continued)

8.

RECEIPTS

Received From	Material	Content
Argonne National Lab.	Waste Solution (Depleted)	16,630.00 gm. 1.12 gm. Pu
C&CCC, K-25 Area	Hanford Waste Scrap (Radioactive Glass and Paper) (Depleted)	70.00 gm.
" " "	Hanford Waste Scrap (Radioactive Glass and Paper)(Depleted)	166.00 gm.
" " "	Waste Solution (Depleted)	6,580.00 gm.
" " "	UF_6 (Normal)	1,311.00 gm.
" " "	Hanford Waste (Radioactive Glass and Paper) (Depleted)	25.00 gm.
C&CCC, Y-12 Area	Uranyl Nitrate (Normal)	76,515.20 gm.
" " "	Normal Uranium	3,487.00 gm.
" " "	Alpha Standards	181.05 gm.
" " "	Uranyl Fluoride (Normal)	563.20 gm.
" " "	Uranyl Nitrate (Normal)	74,196.20 gm.
" " "	Uranyl Nitrate Crystals (Normal)	8,106.20 gm.
" " "	Uranyl Sulfate (Normal)	1,786.80 gm.
Hanford Engineer Works	Irradiated Slugs (Depleted)	135,133.54 gm. 17.68 gm. Pu
" " "	Depleted Uranium	2.817 gm.
" " "	Enriched Uranium 93.38%	.816 gm.
	38.0 %	2.037 gm.
" " "	Hot Uranium Slugs (Depleted)	85,456.36 gm. 50.74 gm. Pu
" " "	Uranium Metal Waste Supernate (Depleted)	22,200.00 gm. 38.00 mg. Pu
Iowa State College	Thorium and Uranium Slag	9.08 kg. U 243.47 kg. Th
	Thorium and Uranium Slag	44.04 kg. U 190.87 kg. Th