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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT
FOR

HW--75702

DE93 007064

NOVEMBER, 1962

Compiled By
OPERATION MANAGERS

December 21, 1962

HANFORD ATOMIC PRODUCTS OPERATION
RICHLAND, WASHINGTON

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By Authority of CG-PR-2

RM Iten 8-12-92

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PM Eick 8-24-92

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CHEMICAL PROCESSING DEPARTMENT
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I. SUMMARY

Production through November, as compared with the October 25, 1962 HAP0 Production Forecast (HW-75289), is summarized below:

	<u>Percent of Forecast Achieved</u>	<u>Fiscal Year</u>
	<u>November</u>	<u>To Date</u>
Separated plutonium nitrate	79.4*	101.6
Separated uranium nitrate	92.3*	104.8
Uranium oxide	81.6	94.3
Plutonium metal buttons	127.2	93.7
Fabricated parts	132.6	102.4

With the exception of plutonium metal buttons and fabricated parts, the production of other products was below that forecasted for November. Mechanical and process difficulties in Redox and Purex were primarily responsible for the low production.

Processing was resumed in the Purex plant on November 5, following a one-week scheduled outage to connect the new neptunium facility (Project CGC-821) to existing process equipment. Subsequent operation, at an average rate of 29.8 tons per day, was continuous except for two and one-half days of downtime, caused by mechanical failures. Process performance was excellent during the operating period.

The continuous neptunium recovery system at Purex (J Cell Package) was started up on 3WB backcycle waste on November 20. Operability tests and neptunium accumulations were continuing at month's end.

E-metal processing in the Redox plant was plagued with frequent unscheduled shutdowns during November. These outages included one period of 35 hours, caused by a leak in the underground raw water line; a second major outage of 62 hours was required to unplug process lines. The line plugs were apparently caused by the interruption in waste reprocessing, which occurred when the process was shut down to repair the raw water supply line. The last two weeks of November were used to perform a nitric acid flush, to complete a neptunium removal run, and to rework some high product waste.

Operability testing of the second annular E-metal dissolver (Mark V), installed in the Redox plant during October, was completed. When subsequent metal dissolvings proceeded satisfactorily, the first annular E-metal dissolver (B-2) was taken out of service to adapt it for the processing of Zircaloy-clad PRTR fuel elements, now scheduled for February, 1963.

*Variation was caused by the increase of "in process" plutonium inventory at Purex and Redox.

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Approval of the contingency maintenance request for the D Cell rehabilitation work in the Redox canyon was received from the AEC on November 17, 1962. Proceeding on a step-wise basis, the following items have been completed to date: (1) the leaking D-14 concentrator has been removed from the cell; (2) sludge entrained by the cell gutters has been sampled; (3) the vessel balance weight on the cell floor has been measured; (4) "Y" pads have been flushed, and; (5) the pad and dowels have been inspected via television.

Tests were concluded in November which confirmed the presence of a leak in the previously deformed 113-SX underground waste storage tank. Details will be presented in document HW-75714, scheduled to be issued next month.

For the past three months, the 234-5 Building Incinerator has processed waste boxes at a rate equivalent to the generation rate. Over-all throughput has been below design capacity, however, and additional leaching equipment is being designed to remedy this inadequacy.

Since last September, the Purex nitric acid recovery system has been operating successfully with single stage evaporation, on a demonstration basis. Improved facilities are now being scoped for a permanent single stage process.

Beneficial use of the 221-B Building Canyon, except for the centrifuge and vessel vent system, was obtained on November 19 for Project CGC -897, "Fission Product Concentrates Storage - 200 East Area." The centrifuge is being modified to permit operation in the low speed range required for fission product recovery; part of the vessel vent equipment arrived late.

Progress on the modifications to fission product shipping casks is as follows:

Conversion of the HAPO-IB-1 is proceeding satisfactorily toward a completion date of December 15.

Revision of the HAPO-IB-2 was delayed by collapse of a crane boom.

Design of insulation for HAPO-II Buffer was completed; installation is scheduled for completion on December 6.

P. H. Linker

General Manager
Chemical Processing Department

07-1225123

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS

A. PRODUCTION OPERATION

<u>1. Production Statistics</u>	<u>November</u>	<u>Fiscal Year to Date</u>
a. <u>Percent of Forecast(1) Achieved</u>		
Separated plutonium nitrate	79.4*	101.6
Separated uranium nitrate	92.3*	104.8
Uranium oxide	81.6	94.3
Plutonium metal buttons	127.2	93.7
Fabricated parts	132.6	102.4
b. <u>Purex</u>	<u>November</u>	<u>October</u>
Uranium nitrate produced (tons)	695.01	772.43
Average production rate during operation (T/D)	29.8	28.0
Total waste loss (%)		
Plutonium	0.40	0.36
Uranium	0.27	0.24
On-line efficiency (%)	82.3	88.9
c. <u>Redox</u>		
Uranium nitrate produced (tons)	61.50	104.85
Average production rate during operation (T/D)	8.0	6.3
Total waste loss (%)		
Plutonium	0.45	0.56
Uranium	0.33	0.34
On-line efficiency (%)	41.0	71.6
d. <u>Uranium Reduction (tons)</u>		
Normal UO ₃ loaded	649.00	581.30
Enriched UO ₃ loaded	89.74	121.60
Normal UO ₃ approved for shipment	638.30	543.88
Enriched UO ₃ approved for shipment	50.30	100.74
Normal UO ₃ shipped	491.91	694.28
Enriched UO ₃ shipped	101.00	100.15
Normal UNH backlog	579	562
Enriched UNH backlog	6	9

(1) HW-75289, HAP0 PRODUCTION FORECAST, dated 10/25/62

*Variation was caused by the increase of "in process" plutonium inventory at Purex and Redox.

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e. Plutonium Metal Processing

	<u>November</u>	<u>October</u>
Input to Task I (batches)	399	239
Reduction yield (%)	95.2	97.2
Product recovery output (Kgs)	56.12	36.44
Product recovery backlog (Kgs)	1487.65	1453.34
Waste disposal (grams)	859	806

f. Power

	<u>200-East</u>	<u>200-West</u>
Raw water pumped (gpm)	10,304	4,802
Filtered water pumped (gpm)	1,093	820
Maximum steam generated (lbs./hr.)	240,000	145,000
Average steam generated (lbs./hr.)	191,000	96,000
Total steam generated (M lbs.)	137,505	69,405
Coal consumed (tons)	7,263	3,653

With the exception of plutonium metal buttons and fabricated parts, the production of other products was below that forecasted for November. Mechanical and process difficulties in Redox and Purex were primarily responsible for the low production.

J. H. Warren
Manager, Production

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (Continued)

B. PUREX OPERATION

1. Operating Continuity

A one-week scheduled outage terminated November 5. Scheduled operation was continuous from November 5 except for three outages totaling two and one-half days due to equipment failures.

2. Processing Operation

Plutonium product decontamination was excellent. Uranium product met specifications except for a brief period following the emergency outage; silica gel treatment of start-up material was successful.

Strontium recovery series #52 and #53 were completed. Two HAPO II casks were loaded with approximately 335 kilocuries total Strontium 90.

Cesium loading of the first STT cask in the current series of four was started on 11/30/62.

The continuous neptunium recovery system (J Cell Package) was started up on 3WB backcycle waste November 20. Operability tests and neptunium accumulation were continuing at month's end.

3. Mechanical Experience

During the scheduled outage, three leaking process jumpers were replaced.

The HA column feed pump (HAF) and the F-10 backcycle waste pump were replaced during emergency shutdowns.

Operating continuity was maintained while replacing the (F-7) 1WW waste agitator.

4. Radiation Experience

The total Iodine 131 emission for the month was 2.04 curies. The maximum seven-day emission was 0.70 curies.

A box of failed process jumpers was buried with good contamination control.

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5. Analytical Experience

An improved analytical method for separation of cesium from strontium and other fission products was developed as a routine analysis.

Manager - Purex

PR McMurray/BEC/sc

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II. ACHIEVEMENTS (Continued)

C. REDOX OPERATION

1. Operating Continuity

E-metal processing in the Redox Plant was plagued with frequent unscheduled shutdowns and only 53 percent of the expected production was achieved. Approximately 35 hours of operating time were lost on November 3 and 4 when a leak developed in the underground raw water line to the plant. Another 62 hours were lost November 5 through November 7, due to the plugging of process lines to the 1A and 2D extraction columns. The line plugs were apparently caused by the interruption in waste reprocessing which occurred when the building was shut down to repair the raw water supply line. The 72 scheduled operating hours that were available during the Thanksgiving week were devoted to a scheduled acid flush of the Redox equipment. The plant remained down the following week to clean the process cell sumps and to complete a neptunium removal run.

The Uranium Oxide Plant operated at satisfactory rates throughout the month. Calcination of enriched uranium in the G Cell calciner was curtailed at various times throughout the month (total of seven days) due to a lack of feed material and the failure of a pump in the acid recovery system.

2. Processing Operations

a. Redox Processing

E-metal processing was discontinued during the last eight days of the month in order to : 1) complete a 60 percent nitric acid flush of the processing equipment; 2) rework a large volume of high product waste; 3) complete a neptunium recovery run.

The 60 percent nitric acid flush of the extraction columns, overflow lines, and associated vessels recovered approximately 2900 grams of plutonium. Of this total, 80 percent was picked up in the 2D partition column and overflow line. Studies are continuing in both the laboratory and the plant to determine the cause of the plutonium deposition in this portion of the Redox system.

After completion of the acid flush operation, a neptunium recovery run was made through the partition and second plutonium cycles using the flow pattern established before the

installation of equipment for continuous neptunium recovery (Project CGC-913). However, only 22 percent of the available neptunium was removed; the major portion was "lost" and was returned to the accumulation system for recovery during December.

Six special one-bucket charges of IPD fuel elements were processed through the conventional C-2 dissolver this month and the necessary samples were obtained for conversion ratio determinations. Dissolving of the eighteen charges originally scheduled for processing has now been completed.

Operability testing of the second annular multipurpose dissolver (Mark V), installed during October, was completed. Removal of the aluminum jackets from the first charge of uranium metal was completed on 11-20-62 and subsequent metal dissolving was without incident.

b. Uranium Oxide Processing

During the week of November 12-18 the two nitric acid pumps (C4-1 and C4-2) in the nitric acid recovery system began to develop leaks which reduced overall pumping capacity. Since one pump can only effectively handle the acid stream from five calciners, the enriched uranium calciner was taken out of service November 19 through 21, while pump repairs were completed.

3. Mechanical Experience

On 11-2-62 a leak was discovered in the twenty-inch diameter underground raw water line servicing the Redox Plant. The leak, which was located just north of the UNH storage area near the exclusion area fence, required a 35-hour outage to make repairs. Because the Redox isolation valve would not hold, a valve near the 200 West Power House had to be closed, thus also interrupting raw water service to the 224-U Building and the 241-SX tank farm. The break was caused by a small jet of water emitting from the bell joint of the connecting tee to the eight-inch diameter water main to the 241-SX tank farm. The scouring action of the water and sand in turn eroded a hole in the twenty-inch main. Months or even years may have been required for the action to cut through the three-quarter-inch thick cast iron pipe.

The B-2 multipurpose dissolver was taken out of service during the latter part of the month and work started to prepare the dissolver for handling Zircaloy-clad PRTR fuel elements which are now scheduled for processing in February, 1963. At month end 14 new jumpers had been installed in the B Cell system. In conjunction with these jumper installations, facilities were also installed which will permit the return of dissolved sludge, rich in sodium nitrate, from the 241-SX tank farm to

the B-2 dissolver for use as a hydrogen suppressant during aluminum jacket dissolution, in place of the commercial chemical now used. If this routing of the sodium nitrate from the tank farms is successful, a significant reduction in the net volume of non-boiling waste generated will be realized as well as a reduced chemical cost of \$10-\$12 per ton of uranium dissolved.

Approval of the contingency maintenance request for the D Cell rehabilitation work in the Redox canyon was received from the HCO-AEC on 11-17-62. In the meantime, rehabilitation work has been proceeding on a step-wise basis. Items completed to date are: 1) removal of the leaking D-14 concentrator; 2) sampling of the sludge entrained by the cell gutters; 3) measuring of the vessel balance weight on the floor of the cell; 4) water flushing of the "Y" pads; 5) TV inspection of the pad and lowels.

4. Waste Handling and Decontamination

Leak testing of the previously deformed 113-SX waste storage tank was completed this month and the tank was found to be leaking.

Equipment valued at \$154,000 was received from the processing plants for decontamination, repair, inspection or burial during the month. Equipment valued at approximately \$32,000 was returned to customers, representing a savings of approximately \$25,000 over the cost of new equipment.

One hundred and sixty-seven fifty-five-gallon drums and five wooden boxes of low level uranium waste from the Coors Porcelain Company, Golden, Colorado, were received and buried without incident.

5. Radiation Experience

There were two contaminated equipment transfers from the 202-S canyon building during the month. In both cases the new stainless steel multipurpose transfer box was used and both equipment transfers were made without incident. These initial runs, using the new box, indicate a definite improvement in radiation levels and contamination control.

Three radiation occurrences were recorded during the month. Most significant was the occurrence in which a process operator received a small laceration on his right index finger while removing a contaminated plastic covering from a television cable. A survey of the wound area indicated beta-gamma contamination of 400 counts per minute above background. Although the contamination was apparently successfully removed in the field, bioassay sampling has been started.

6. Analytical Experience

A change in product specifications for the Uranium Oxide Plant

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necessitated numerous particle size determinations to determine optimum operating conditions.

A procedure for the determination of the total ion content of the river water to be used at the new 100-N water treatment facility was developed and tested. This procedure will be used to control the optimum throughput between regenerations of the water demineralization units.

Analytical assistance was provided to the Non-Metallic Materials Development group in the evaluation of a new cobalt-vanadium foil as a possible experimental flux monitor to be used in the Atomic Energy Commission's Reactor Materials Testing program. There is no knowledge of any previous work having been done in this field with cobalt-vanadium alloy.

Manager - Redox

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (Continued)

D. WEAPONS MANUFACTURING OPERATION

1. Operating Continuity

Fabrication activities were conducted at a rate approximately the same as those of the past two months. Model 1251 was produced exclusively and there were no significant interruptions in this work. Production of unfabricated plutonium was satisfactory with numerous minor interruptions for repairs to the equipment in Hood 9-B and in the new ion exchange system. Recovery activity consisted of the burning and dissolution of skull materials and the incineration of packaged dry wastes. There were no significant interruptions in these latter areas.

2. Processing Operations

a. Plutonium Fabrication

Information on plutonium fabrication is presented in Document HW-75789 entitled "Chemical Processing Department, Weapons Manufacturing Operation, Z Plant Monthly Report, November, 1962" which is classified "Secret, Atomic Weapon Data, Production Rate and Stockpile Quantity Information."

b. Plutonium Processing

Operation of the plutonium processing line was satisfactory. The November schedule was exceeded by ten per cent.

Operation of the new ion exchange equipment in Hood 46 was generally successful; although, there were a number of production interruptions associated with the initial operation. Recovery of 98.5 per cent of the plutonium from the supernates treated in the unit was demonstrated. However, process and mechanical problems persist, with valence state and rupture disc reliability under study at month end.

The dissolution of skull material was resumed at midmonth, and the resulting feed contributed significantly to the button line production.

The incinerator continued to perform consistently; however, the over-all throughput remains below the design capacity. Additional leaching equipment is being designed to remedy this inadequacy.

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3. Mechanical Performance

Fabrication equipment performed well with only minor repair work necessary.

Plutonium processing line equipment required considerable maintenance effort, with the Hood 9-B off-gas system being the greatest problem. Work was started on the reactivation of Hood 9-A so that processing can be transferred to it and thus permit the repair and complete overhaul of Hood 9-B.

Final inspection equipment operation was satisfactory. Sheffield Gage No. 1 was completely overhauled during the month.

4. Radiation Experience

Radiation and contamination control statistics indicate that control is satisfactory. There were no significant occurrences this month.

5. Analytical Experience

	<u>October</u>	<u>November</u>
Number of Samples Received	2,192	3,180
Number of Determinations	19,267	16,756
Total Metallic Impurities, Buttons	1,044 ppm	1,632 ppm
Total Carbon Content	315 ppm	370 ppm
Buttons Rejected	24.6%	8.9%
Pu 240 - NRF Buttons (by Mass Spec.)	7.69%	----
Pu 240 - Normal Buttons (by Mass. Spec.)	-----	6.06%
Pu 240 - Normal Buttons (by Neut. Count)	5.99%	5.94%

6. Miscellaneous

A fire occurred on November 26 in Room 221 (Recuplex area) where Minor Construction forces were welding at the decontamination hood. A spark ignited the plastic greenhouse surrounding the hood and a considerable amount of dense smoke was generated. There were no injuries, and damage was limited to the loss of one poppy instrument and to smoke-covered walls and ceiling in the immediate area. There was no significant interruption to the continuity of operations. A separate report of the investigation of the fire has been issued.

W. J. Gaston
 Manager
 Weapons Manufacturing

CHEMICAL PROCESSING DEPARTMENT
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November, 1962

II. ACHIEVEMENTS (Continued)

E. POWER AND GENERAL MAINTENANCE OPERATION

1. Operating Continuity

A break in the 20" raw-water line to the Redox facility occurred on November 2, resulting in a 34.5-hour water outage to that facility. Steam, water and emergency electrical services to other production facilities in the 200 Areas continued uninterrupted throughout the period covered by this report.

2. Inspection, Maintenance and Repair

Installation of the Hadley Balance for the Weapons Manufacturing Operation was 70% complete at month's end. The instrument is for weighing and determining the density of plutonium remotely. The electrical and instrumentation phase of the work is essentially complete. Assembly and testing of the precision balance parts is the principal work yet to be completed.

The modified design for the HAPO-I strontium cask was completed and approved for construction early in November. Fabrication and assembly work was started immediately, in order to meet the required December 15 completion date. Many delays and modifications to design have affected progress to some extent. These are attributable to variations between the prints and the parts salvaged from the original HAPO-I cask. Work progress is approximately 60% complete at this time, with overtime being utilized in order to meet established completion dates.

Repairs and modifications to the Redox backcycle concentrator were completed. The vessel, as received from the vendor, contained many faulty welds that had to be ground out and replaced. All dunnage for the vessel was converted from black iron to stainless steel, in order that it might better withstand the highly corrosive atmospheric conditions of the cell. The unit is in standby status at this time.

Twenty-three cell pipe jumpers were fabricated to meet requirements, as indicated below:

Redox	9
Purex	13
Redox (Spare Parts)	<u>1</u>
Total	23

Fabrication of a new loop for the upper section of the plutonium concentrator at Redox is in progress. The new loop is of titanium and will be held as a spare.

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An inspection of No. 4 and 5 boilers in the 200-East Area Power House disclosed that repairs of a month ago on the bulging water wall tubes were still effective. No leaks or new bulges were in evidence.

The 200-East Area Power House experienced a fire in the coal silo November 26. Spontaneous ignition of coal fines was determined as being the most probable cause. Damage was limited to the wooden enclosure over the elevator pit, the vibrator motor, gear head motor, and various electrical controls, wiring, conduit, etc. Normal conveyance of coal from the storage pit and coal cars to the bunkers inside the power house was not interrupted. The fire was discovered at 3 a.m., and was under control by 7 a.m. Temporary wiring was installed, permitting operation of the silo elevator. All coal has been removed from the silo, and repairs are currently in progress.

Capacity tests conducted on the new emergency raw-water steam turbine pump, recently installed in the 200-East Area Reservoir and Pump House, were satisfactory. Results showed pump capacities comparable to the manufacturer's performance rating of 6000 GPM at 270' head pressure.

T. G. LaFollette

Manager
Power and General Maintenance

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (continued)

F. FACILITIES ENGINEERING OPERATION

1. Purex

a. Process Design Engineering

Single-cycle Acid Recovery Process

The recovery of nitric acid from Purex high-level waste has been carried out successfully for the past three months on a demonstration basis, using a single-cycle rather than a two-cycle process. In this demonstration, the F-11 concentrator has been removed from service. The F-12 and F-7 tanks have been used for feed and run-down tanks, respectively, for the F-6 concentrator. Overhead vapor from F-6 is further decontaminated in the F-F6 Prototype Demister prior to rectification operations in F-5 and the Vacuum Fractionator.

Improved facilities are being scoped for the permanent single-cycle process. Basically, a spare standard 5,000 gallon tank would be modified into a two-compartment tank for installation in the F-7 position for the F-6 feed and discharge functions. This will free F-12 for future service with the F-11 concentrator in OWW or general utility concentration service. A preliminary engineering flow diagram of the new equipment and routings has been issued.

HAP Gamma Monitor

The top portion of the lead shielding was installed without incident in the test location at Purex. Apparently, normal operation of the electronic instrumentation was obtained, and the results were confirmed by comparisons with results from a laboratory mock-up of the monitoring system. However, operation of the HAP monitor has not produced the type of information expected and desired. Apparently, the desired results are being masked by background radiation derived from either product deposition or spillage in the monitored area. Surface decontamination is being attempted as a first step to obtain acceptable results.

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b. Project Engineering**CGC-897 - Fission Product Concentrates Storage System -
200-East Area**

Beneficial use of canyon, except for the centrifuge and vessel vent system, was achieved on November 19. A new Purex-type, 3-range speed indicator is being installed on the centrifuge to permit operation in the low speed range required for fission product recovery. The vessel vent off-gas heater is on-site and nearly ready for installation.

CAC-945, Rev. #2 - New Waste Storage Tanks - Purex

A project proposal revision to request total project funds, in the amount of \$2,700,000, was transmitted to the Atomic Energy Commission on November 8. The bid package information letter for tank fabrication and erection was sent to the Commission on November 30.

CGC-964, Rev. #1 - Equipment Disposal - Purex

A project proposal revision, requesting funds in the amount of \$1,000,000, was transmitted to the Commission on November 2.

2. Redox**a. Process Design Engineering**

A sample of the material on the "D" Cell floor was obtained on November 10, and a spray nozzle for flushing was tried out. Measurements were obtained for design of special devices to remove portions of the equipment and the "Y" pad. A special remote electrical connector sub-assembly has been designed with 33 contact points, and is to be used with 110 volt maximum. It will be tested in the cell by means of the television camera. If successful, this connector will provide an easier means of television installation in a canyon cell and will also help solve some of the electrical installation problems now found in fission product cell design.

Two new jumpers were designed for a jet transfer between tanks D-7 and D-9. This routing is in conjunction with the bypass of D-14 Vessel.

b. Project Engineering**CGC-929 - NPR Fuels Processing Facilities**

The present directive authorizes the installation of facilities in the Redox Plant which will permit preliminary testing of the Zirflex process. All of this work has been completed, and

there will be no more project work until receipt of a directive covering the remainder of the project which was requested in the project proposal.

3. Weapons Manufacturing

a. Process Design Manufacturing

RMC Button Line

A program was developed during the month to renovate Hood 9 of the RMA Line so that Hood 9 of the RMC Line could be shut down for an extended period to allow completion of major equipment modifications. Scoping and design work have been initiated for the following new process equipment: rotary drum filter, fluorinator tube and filter, HF off-gas system, and calciner insulating jacket. Initial efforts were concentrated on the re-design of the fluorinator tube. Preliminary prints for the new tube and filter have been distributed for comment.

Fabrication of a calciner off-gas "blow-back" filter has been completed. The filter will be installed in Hood H-9B when criticality reviews and approvals are completed.

RMC Fabrication Line

The HC-26R Ingotting Glove Box has been fabricated and is scheduled for installation during December.

Authorization has been given to a G. E. Manufacturing Services, Schenectady, to prepare specifications for open market procurement of a Numerical Input System for existing machining lathes. Design has been completed for installation of a larger water storage tank for the chiller unit in the gaging equipment room.

RMA Fabrication Line

Design was completed on changing the 5th Stroke Perchloroethylene Coolant System from carbon steel to copper. Also, design was completed on a new Floturn blank mold and mold templates. This design is based on a 70 percent modified shear theory.

A scope document for all of the equipment planned in the RMA Line, for preparation of metal blanks, has been completed and is being routed for approvals. This document combines the scope of three approved projects on the mezzanine,

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storage, and casting auxiliaries facilities, as well as the scope of the projects not yet approved, such as additional casting and degreasing and briqueting.

b. Project Engineering

CGC-968 - Additional Plutonium Storage Facilities - 234-5 Building

Fabrication of the storage hood (HA-23S) is underway in the J. A. Jones Company Shops, using approved drawings issued on November 21. The second hood (HI-74S) is being designed.

CGC-983 - Plutonium Ingotting and Auxiliaries Facility--RMA Line-234-5 Building

Detail design was started on November 15, by the Construction Engineering and Utilities Operation. Procurement was initiated on the same date by withdrawals from the spare equipment warehouse.

CGC-990 - Degreasing and Briqueting Facility--RMA Line-234-5 Building

A project proposal for degreasing and briqueting facilities in the RMA Line was transmitted to the Commission on November 2.

c. Manufacturing Engineering

Production Control Assistance Fabrication

The new Ingotting Data Card was installed and is being evaluated for optimum effectiveness.

The new machining data card has been designed and instructions for implementing the form are being developed.

4. General

a. Process Design Engineering

Fission Product Shipping Casks

The conversion of the HAP0-IB-1 Cask is proceeding satis-

factorily toward a completion date of December 15.

Revision of the HAPO-1B-2 cask, completion scheduled for January 1, 1963, has been delayed by collapse of the crane boom used to position the cask for minor decontamination.

The design of insulation for the HAPO-II Buffer is complete, and the buffer has been delivered to the Jones Construction Company for installation. Completion is scheduled for December 6.

Design of the insulation for the HAPO-I Buffers is underway. Completion of the design is scheduled for December 6. Installation is to be completed by December 20 for the first cask container and by January 4, 1963 for the second one.

UO₃ Shipping

At the request of HOO-AEC, a study has been initiated to scope the requirements for use of some existing closed RR cars in place of the flat cars presently used. The closed cars, now owned by the Commission, would have to be modified to remove existing dunnage, to provide new dunnage for UO₃ containers, and to provide doors and head room for loading of metal to be shipped from Fernald on the return trip. In addition, a crane will be required near 271-U Building for loading the UO₃ containers. The HOO-AEC will complete the over-all economic survey, including costs of shipping, etc.

a. Project Engineering

Project Cost Information - as of 11/18/62:

Total Authorized Funds-20 active projects	\$ 11,920,000
Total Cost-to-date	9,576,000
Commitments and Openm Work Releases	554,000
Unencumbered Balance	1,790,000
Costs Charged to Above Projects	
10/21/62 to 11/18/62	265,000

HP Shaw/WWC/alr

Manager
Facilities Engineering

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

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II. ACHIEVEMENTS (Continued)

G. RESEARCH AND ENGINEERING OPERATION

1. Purex Process Engineering

a. Solvent Extraction

Process performance was excellent during the month despite a number of emergency shutdowns. The plant was started up on November 5 with cold recycle uranium feed and performance was outstanding until November 11 when a backcycle waste pump failure necessitated an equilibrium shutdown. Subsequent minor equipment malfunctions resulted in severe burst of activity in the First Cycle when the plant was started up November 12. The activity was kept out of the Second and Final Plutonium Cycles by temporarily recycling the plutonium product from the partition column to the Backcycle Waste Tank. The activity of the uranium product from the partition column increased approximately ten-fold because of the burst. First Cycle plutonium losses for the month were very good, averaging less than 0.05 per cent. Performance of the Second Plutonium Cycle was excellent the entire month, with decontamination factors ranging from 2000 to 7000. The higher D.F.'s were coincident with higher feed activity. All product was well below activity limits for processing through the Final Ion Exchange Cycle.

Performance of the Final Uranium Cycle continued to be good. Rework of solvent-bearing uranium which resulted from the pulse generator outages prior to the October shutdown apparently introduced an emulsifying agent into the solvent, as it was necessary to reduce the frequency of the 2D Column by ten cycles per minute until the rework of this material was completed. Four batches of uranium exceeded specifications with respect to plutonium contamination. The gamma burst during the November 12 startup resulted in fifteen batches which exceeded activity limits and required treatment by silica gel. For a short time after startup (~ 32 hours), the Final Uranium Cycle processing rate was increased to 4.4 C.F. without any noticeably adverse effects except for a ten per cent decrease in D.F. The rate was reduced back to 3.6 C.F. and operation remained excellent the rest of the month.

b. Neptunium Recovery

Neptunium accumulation in the Backcycle Waste System (3WB Stream) was normal during the month, with losses averaging

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15 and 10 per cent via the First Cycle waste (HAW) and Second Uranium Cycle product (2EU) streams, respectively. No abnormally high losses were experienced although the high plant neptunium inventory and operation with reduced uranium backcycle were reflected in the trend toward higher 2EU carryover.

Hot startup of the Continuous Neptunium Recovery System (J-Cell Package) commenced on November 20 following preliminary run-in tests and diversion of a portion of the Backcycle Wash (3WB) stream to the package. Accumulation during the first week was below anticipated levels due to non-optimum operating conditions and an imbalance in the uranium and nitric acid concentrations in the 3B Column product recycle (3NBR) stream. Operation of the equipment proceeded smoothly, however, and at month's end hot run-in tests were underway to improve neptunium accumulation.

c. Waste Concentration

Single-stage acid recovery was continued throughout the month with equilibrium fission product activity levels in the recovered acid remaining at about 1.0×10^5 uc/gal for ruthenium and 1.5×10^4 uc/gal for zirconium-niobium. Equilibrium operation included the addition of 0.01 M NaNO_2 to the feed to the waste concentrator and an overflow rate of the concentrated waste (IWW) of 6 relative flows (~ 50 gal/TU).

An analyses of concentrator corrosion as determined from the results of samples taken from various Purex waste streams during the May-June, August and October 1962 run periods is reported in HW-75732. The data indicate that the corrosion iron in the high activity waste (IWW) during the May-June period was 85 - 130 per cent above the estimated "normal" corrosion iron content of 4.5 lb/T uranium processed. The IWW high corrosion iron content occurred shortly after installation of a new No. 1 Waste Concentrator, but subsequently dropped to the normal level. Conversion to single-stage waste concentration further reduced the corrosion iron approximately 50 per cent. No breakdown for corrosion rates between the No. 1 and No. 2 Waste Concentrators was possible while operating with a two-stage system because of an unmeasured flow between the two vessels; however, the corrosion iron split for single-stage waste concentration is roughly 50 - 50 between the Backcycle Waste Concentrator (E-H4) and the Waste Concentrator (E-F6).

d. Fission Products

Strontium recovery operations in the Purex head-end were halted at month's end and the system flushed for a cesium recovery campaign.

Two HAPO-II slurry filter casks were loaded with strontium-90. The loadings were the first made from product which had the citrate destroyed with hydrogen peroxide. Precipitation characteristics were normal and the loadings routine.

2. Redox Process Engineering

a. Solvent Extraction

A 57 percent nitric acid flush of the extraction columns, overflow lines, and associated vessels was made during November. A total of 2950 grams of plutonium was recovered, of which 2371 grams came from the 1A Column and overflow line. The bulk of the plutonium came from the column instead of the overflow lines. This was in contrast with past experience. Data on deposition in the 1A Column and overflow line are tabulated below:

<u>Date of Flush</u>	<u>Grams Recovered from the 1A Column</u>	<u>Grams Recovered from the Overflow Line</u>
September, 1960	1170	6520
January, 1961	17	83
May, 1961	10	33
October, 1961	37	551
January, 1962	88	166
March, 1962	257	858
July, 1962	258	2113
November, 1962	2183	188

Maintaining the acid concentration in the organic phase of the 1A scrub section at 0.02 M HNO_3 or greater appears to have been effective in retarding plutonium deposition in the overflow line during July to November. However, the rate of deposition in the lower portion of the 1A Column appears to have increased.

At the completion of acid flush operation, a neptunium run was made through the partition and second plutonium cycle. (This is the same flow pattern as was used prior to Project CGC-913.) On this flow-sheet a 1BX stripping solution with the composition of 1.5 M AN_3 , 0.11 M $\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2$, 0.05 M $\text{NH}_2\text{SO}_3\text{H}$, and 0.4 M HNO_3 was used to strip the neptunium in the 1B Column. There was not enough sulfamic acid in the solution to complex all of the nitrous acid and prevent the iron from oxidizing in the head tank and 1B Column. As a result only 22 percent of the available neptunium was stripped in the 1B Column. The remainder carried over into the 1C Column and 3DF Concentrator, and was subsequently returned to the accumulation system.

b. Waste Storage

A leak test of the previously deformed 113-SX Waste Tank was completed during November and the tank was found to be leaking. A detailed report covering the test will be issued during December (HW-75714, "Leak Testing of the 113-SX Tank", G.L. Hanson, H. W. Stivers, F. Stong).

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3. Plutonium Process Engineering

a. Metal Finishing Operation

1. Button Line

Button densities continued good throughout the month with 5.8 percent rejects, with most rejects being attributed to Task III burned lids. Toward month-end, all skull oxide glass dissolvers resumed operation with the aluminum addition step eliminated and the final solution going direct to Task I and constituting as high as 45 percent of the feed. Periodically over the entire month, one can of stored aluminum-complexed MR feed was added to a Task I feed batch (constituting about 7 percent of the feed when added). Product from the Sn ion exchange system became a routine addition to Task I feed (in 10 percent of the feed batches and constituting 3.5 to 17 percent of the plutonium in the feed). A report evaluating the behavior of dissolved skull oxide solutions (MR feed) in the button line was issued (HM-75535).

2. Skull Dissolution

Heat exchangers for cooling dissolved skull oxide solutions have been installed in both glass dissolver hoods. The exchangers cool the solution to less than 30° C before loading out into PR cans. At 30° C or less, serious corrosion in the PR cans and subsequent stainless steel tanks is avoided. The heat exchanger allows rapid removal of the solution from the glass dissolver to the PR can, thereby increasing capacity and decreasing boron impurity pick-up from glass deterioration.

3. GGC-978, Oxalate Supernatant Ion Exchange Facility

"Shakedown" operations have continued in the anion exchange facility, with operation significantly improved during the last half of the month. Basic workable flowsheet conditions have been established for the facility. However, difficulty has been encountered in maintaining "flowsheet" conditions because of (1) flow control problems, and (2) frequent interruptions in operation prompted by equipment difficulties.

Suitable flowsheet modifications have been specified to eliminate the plutonium-six valence problem discussed last month. Basically the plutonium-six in the oxalate supernatant solution is first reduced with ferrous sulfamate to plutonium-three, then reoxidized to plutonium-four with sodium nitrite. Although the past month's operation has been marred by occasional batches of high ion exchange column waste (occasionally making it necessary to return to processing supernatants in the primary plants), operation of the unit has been relatively successful. Approximately 55 percent of the available oxalate supernatant has been processed through the ion exchange facility and

approximately 98 percent of the plutonium content of these supernates has been recovered. (Average throw-away concentration of ion exchange waste for the month was 0.012 g. Pu/liter.) Each of the three ion exchange columns has been successfully eluted.

4. Incinerator

During the past three months, the incinerator has remained current. That is, burnable boxes of wastes have been incinerated at the rate at which they are generated. Before the inventory of waste boxes can be significantly reduced, improvements in the incinerator system are required. The plutonium mass limits of the facility must be increased above the current 250-gram conservative start-up limit. Many of the waste boxes stored contain up to 400 grams of plutonium and cannot currently be processed through the facility. Equipment modifications are also required in the facility to eliminate production "bottle necks" in the leach hoods and scrubber system. As a first step in eliminating these "bottle necks", flowsheet and equipment specifications have been issued for a new leach hood (HW-75675). Studies are being initiated with the objective of increasing the allowable plutonium limits of the facility.

5. D-7 Sump Tank

Solids accumulation in the D-7 12,000-liter 234-5 Building sump tank prompted a neutron count survey and subsequent clean-out. About 300 pounds of solids, containing between 50 and 100 grams of plutonium, were eventually flushed to the Z-12 crib. Samples of the solids studied in the laboratory indicated that the plutonium could not be economically leached from the solids. Additional tank studies are planned to determine the effectiveness of the flush procedures and post-flush tank status.

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4. Separations Chemistry Laboratorya. Purex Process Assistance

Permanganate was evaluated as an agent for water treatment prior to the normal alum treatment. The purpose was to ascertain whether treatment at this point might replace the solvent permanganate treatment within the plant on the assumption that the "do-bads" originate in the water. Using Redox distillate bottoms as the source of "do-bads", uranium transfer rates were improved from 6 to 13% by pretreatment of the water with 7 ppm permanganate. Application of a procedure utilizing permanganate on a plant test basis is being considered.

b. Redox Process Assistance

Flowsheets for a saltless 3D column (3rd cycle uranium) have been investigated and column profiles determined for uranium and nitric acid. Since it is desirable to operate with an acid deficient extraction section to obtain maximum fission product decontamination, the following limitations as found in laboratory experiments must be considered: (1) At an acid deficient value of 1.5 M, a uranium precipitate is formed. Thus, the aqueous acid deficiency must not be allowed to approach 1.5 M. (2) When using concentrated uranyl nitrate feed, the aqueous phase is considerably reduced in volume due to the mass transfer of uranyl nitrate, thus resulting in an increased acid deficiency in the remaining aqueous phase. For example, a 4.8 M UNH feed solution with an acid value of -0.6 M will result in an aqueous phase acid deficiency of greater than 1.5 M when contacted with hexone in an extraction column.

It was determined that losses in the final neptunium extraction column were due to incomplete oxidation to the hexavalent state. Cause of the incomplete oxidation was insufficient acid to counteract the reducing potential of hexone associated with the tank contents. The acidity of the dichromate system as it existed in the tank should have exceeded 1 M to effectively oxidize the neptunium.

c. UO₃ Plant Assistance

Two monthly dissolver solution composites from Purex were analyzed for uranium by both coulometric and colorimetric procedures. The resulting Pu/U ratios indicates a possible low bias (up to 3%) due to the coulometric analysis. More comparisons will be made.

Two problems of concern at UO₃ Plant were investigated.

- 1) The fluff powder occurring during enriched uranium calcination was found readily soluble in nitric acid. Solutions could be prepared to meet rework specifications.
- 2) Cores up to a half inch thick have formed in some UNH piping. In the past, nitric acid flushes have failed to remove this wax-like,

very hard material. The core was dissolved slowly by hot (90 C), 50% sodium hydroxide. The chemical composition of this material has not yet been determined.

d. Laboratory Assistance

A mechanized 10 ml piston burette (Metrohm) was calibrated and delivered to the 234-5 laboratory for trial evaluation. Standard deviations for the total calibration was ± 0.001 ml. Hence the instrument has some promise of improving performance on the chemical assay.

The analysis for plutonium valence distribution by TTA extraction was modified for use with oxalic acid solutions. By limiting the oxalate concentration to 0.05 M in the aqueous phase, and making two successive plutonium(IV) extractions, the procedure gave results that could be verified by the DK-2 spectrophotometer.

HAPO, ANL, BMI, BNL, MTR, NMPO, NRDL, and General Atomics personnel involved in a recently completed exchange of irradiated foil wires, met at Argonne National Laboratory late in November to discuss ways and means of reducing the between-site discrepancies in analytical gamma activities. Arrangements were made for a second source exchange, based on the findings of the first exchange. Four types of foils will originate at HAPO while a fifth type will originate at ANL. All foils will be analyzed at HAPO first, as in the previous exchange.

At the request of the AEC, a sample exchange program with New Brunswick Laboratory is being set up. Selected uranium and plutonium process streams in Redox, Purex, 234-5, and U-plant will be sampled, analyzed, and the samples shipped to NBL for verification analyses at a frequency rate of up to 10 per year for each sample type. The success of this program will determine whether an AEC-wide program will be initiated.

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5. Plutonium Chemistry Laboratorya. Direct Calcination Of Plutonium Nitrate

Direct calcination of plutonium nitrate solution to reactive oxide has been demonstrated at calciner temperatures up to 350 C.

A one-kilogram-scale direct-calcination run (SC-7) was made in the screw calciner. Nominal conditions were $T = 250\text{ C}$, $\text{SO}_4 = \text{Pu} = 0.5$. Seven hundred grams of oxide were collected. Sustained throughput was 100 g Pu/hr. Samples were collected corresponding to calciner temperatures of 225 ranging up to 350 C. The 350 C sample was chlorinated to approximately 100 percent in a thermobalance reactivity test. Pu assays for the oxide samples averaged 65 percent; higher temperatures gave slightly higher assays and vice versa. Corrosion of the stainless steel calciner was appreciable; iron, chromium, and nickel were high. The oxide product lost 30 percent weight upon high-firing to 1000 C.

b. Continuous Electrowinning

The ceramic test series is leading to useful conclusions about cell materials. Tests of a full-scale cell are under way.

Analysis of the ceramic test series to date is not complete. However, several points have been established. Calcium zirconate, like other zirconia-based ceramics, is not a suitable container for electrochemical reasons. Spinel and MgO-TiO_2 are about comparable from the corrosion standpoint; however, spinel causes aluminum contamination of the product. Lucalox is significantly more corrosion-resistant than MgO-TiO_2 .

Two additional ceramic tests were made during this period, both with MgO-TiO_2 (blue) cells. The first run was not a valid test, as it had an early dump of its melt and ran for a period on pure PuCl_3 . This resulted in severe corrosion of the cell and vent tube. In contrast, the second run did not have this type of corrosion, as melt was present and other conditions were duplicated.

Off-gas samples from recent runs were analyzed with a gas chromatograph and CO and CO_2 were detected at some time in each run. The volume of CO and CO_2 produced correlates closely with current flowing in the cell. High current and high gas volume occurred at the same time. Large amounts of CO were found in the gas samples from the run in which extreme corrosion occurred due to loss of melt.

Four runs were made in the large cell (Mark II). Maximum production rate was over 150 grams an hour for $1\frac{1}{2}$ hours. Paral-

1el anode and cathode areas provided the best configuration for maximum current (excess of 260 amps at available voltage). A PuCl_3 concentration in excess of 30 percent by weight is required because of anode effect (dropping off of current). Bubbling chlorine through the melt before use eliminated frothing usually encountered at the start of the run. The same vent tube was used for all four runs with very little evidence of corrosion.

c. Ion Exchange Waste Losses

The high waste losses from ion exchange were shown to be due to Pu(VI) . The use of 0.02 M ferrous sulfamate - 0.1 M sodium nitrite as a valence adjustment step for oxalate filtrates was demonstrated.

Shortly after startup of the ion exchange system for oxalate supernatants, high waste losses (0.1 - 0.3 g/l Pu) were encountered. A TTA extraction test on this solution showed a high percentage (80 - 100 percent) of inextractable plutonium, presumably due to Pu(VI) . Work was instituted to establish valence adjustment procedures.

Two approaches were taken. The first was to investigate the effect of increasing the peroxide concentration in the valence adjustment step prior to oxalate precipitation. The results of this study are:

1. Hood 6 feed before valence adjustment routinely contains 10 - 40 g/l Pu(VI) , 1 - 2 g/l Pu(III) , and 150 - 200 g/l Pu(IV) .
2. The Pu(VI) concentration in the adjusted Task I feed remains constant at about 0.2 g/l despite increasing the peroxide concentration from 0.5 to 0.9 molar.
3. Absorption spectrophotometer scans of unkilld filtrate (prior to Fe^{+2} , NO_2^- adjustment, over a three-day period show no significant amounts of Pu(VI) [less than 0.01 g/l].

The second approach was to study valence adjustment in the oxalate supernatants.

1. Unkilld filtrate spiked to 0.1 g/l Pu(VI) was completely reduced to Pu(III) by 0.02 M Fe^{+2} and then completely oxidized to Pu(IV) by 0.1 M NO_2^- .
2. Spectrophotometric scans of periodic plant samples of unkilld filtrate, adjusted filtrate, and ion exchange feed (8 M HNO_3) showed no increase in Pu(VI) . No Pu(VI) was adsorbed on the plutonium oxalate fines and then released by dissolution in nitric acid.
3. Spectrophotometric scans of most of the high ion exchange wastes showed only Pu(VI) present.

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4. A sample of ion exchange waste was completely reduced to Pu(IV) at room temperature in five minutes when a stoichiometric amount of Fe^{+2} was added. A 10-fold excess of Fe^{+2} added to the same waste batch did not further reduce the Pu(IV) to Pu(III).

Thus, an effective valence adjustment procedure is available. The source of Pu(VI) in the filtrates is still not known.

Manager
Research and Engineering

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II. ACHIEVEMENTS (Continued)

H. FINANCIAL OPERATION

1. Production Cost

The FY 1963 Midyear Budget Review was completed and forwarded to Contract and Accounting Operation for consolidation on November 19, 1962. Summary data, including details of significant changes, unit cost comparisons, and important cost reduction efforts, was prepared for the Department General Manager and section managers for use in a review of the budget prior to its submission.

The following AEC requested studies were completed this month:

- (1) FY 1962 Dry Waste Disposal Costs
- (2) Costs of shipping 500,000 curies of cerium to ORNL in February.
- (3) Analytical breakdown of Pu Recovery costs included in the FY 1963 Midyear Budget Review.

Additional cost coding was introduced in November to further segregate engineering process support charges between the Incinerator and Pu Recovery.

Eleven special requests were processed for billing during the month including shipment of Pu samples to Belgium, Spain, West Germany, Austria and Sweden; sample work for ORNL, APED, and Rocky Flats; and burial of 167 drums and 5 boxes of contaminated material from Coor's Porcelain Company, Golden, Colorado.

CPD's investment in inventories at October 31, 1962 compared with budgeted amounts is as follows:

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(in thousands)	<u>Balance 10-31-62</u>	<u>Control Allocation</u>	<u>Surplus (Deficit)</u>
<u>Inventories</u>			
Essential Materials	\$ 804	\$ 832	\$ 28
Spare Parts & Standby	1 706	1 400	(306)
Special Materials	<u>121</u>	<u>100</u>	<u>(21)</u>
Gross Inventories	<u>2 631</u>	<u>2 332</u>	<u>299</u>
<u>Reserves</u>			
Essential Materials	61	62	(1)
Spare Parts & Standby	<u>683</u>	<u>350</u>	<u>333</u>
Total Reserves	<u>744</u>	<u>412</u>	<u>332</u>
<u>Net Investment</u>	<u>\$1 887</u>	<u>\$1 920</u>	<u>\$ 33</u>

2. Personnel Accounting

One disability pension claim was processed in November and action was started for settlement of pension and insurance in the case of the death of an employee.

3. General Accounting*

As of October 31, 1962, twenty active projects had incurred costs of \$9,353,669 against authorized funds of \$11,984,200. Outstanding commitments totaled \$470,166.

During November, nine Appropriation Requests were approved, authorizing an expenditure of \$150,340 as follows:

<u>AR Number</u>	<u>Description</u>	<u>Operation</u>	<u>Amount</u>
36017	Stub Conveyor and Air Lock - RMA Line	WMO	\$ 43 000
36037	Hood 9-B Equipment Replacement	WMO	35 500
36022	X-Ray Diffractometer - Spectrometer	WMO	25 000
36020	Alarm Sirens	FEO	15 500
36018	Tool Grinding Equipment	WMO	11 000
36023	Gas Chromatograph	WMO	10 000
36024	Power Hacksaw	P&CM	4 200
36021	Alpha Proportional Counters	Purex	3 960
36025	Two Ton Jib Crane	P&CM	<u>2 180</u>
	Total		<u>\$150 340</u>

*Funding approvals only. May differ from costs stated in other sections of this report which include non-fund equipment transfers.

Manager - Finance

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III. PERSONNEL ACTIVITIES

A. FORCE SUMMARY

<u>Operation</u>	<u>Monthly Salaried</u>		<u>Weekly Salaried</u>		<u>Total</u>	
	<u>10-31-62</u>	<u>11-30-62</u>	<u>10-31-62</u>	<u>11-30-62</u>	<u>10-31-62</u>	<u>11-30-62</u>
General Manager's Group	11	11	2	2	13	13
Financial	13	13	15	15	28	28
Research & Engineering	61	61	28	29	89	90
Facilities Engineering	60	63	21	22	81	85
Power & General Maintenance	38	38	245	243	283	281
Production	6	6	4	4	10	10
Redox	57	57	240	239	297	296
Purex	65	65	249	248	314	313
Weapons Manufacturing	<u>51</u>	<u>51</u>	<u>222</u>	<u>221</u>	<u>273</u>	<u>272</u>
Total	<u>362</u>	<u>365</u>	<u>1 026</u>	<u>1 023</u>	<u>1 388</u>	<u>1 388</u>

B. PERSONNEL CHANGES

No personnel changes during the month of November.

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C. TRIPS

<u>Visitor</u>	<u>To</u>	<u>Nature of Discussion</u>
<u>To Other G.E. Components</u>		
J. M. Pinkerton	Vallecitos Laboratory San Jose, California	To Attend Machineability Conference. (11/5-9/62)
T. G. LaFollette	Crotonville, New York Pittsfield, Mass. New York, New York	Plant engineering and maintenance. (11/19-21/62)
P. H. Reinker	Valley Forge, Pa.	Business conferences. (11/30/62)
<u>To AEC and Other AEC Contractors</u>		
R. C. Hollingshead	Lawrence Radiation Lab. Livermore, California	To attend meeting of I.M.O.G. Machine Design Subcommittee. (11/13-15/62)
R. E. Olson F. W. Gates	Union Carbide Nuclear Co. Oak Ridge, Tennessee	I.M.O.G. Meeting. (11/26-28/62)
A. E. Smith H. H. Hopkins, Jr.	Los Alamos Scientific Lab. Los Alamos, New Mexico	To attend Plutonium Exchange Group Meeting. (11/27-28/62)
H. H. Hopkins, Jr.	Dow Chemical Company Rocky Flats Plant Denver, Colorado	Exchange of technical information. (11/29/62)
W. H. Zimmer	Argonne National Lab. Chicago, Illinois	Counting Intercali- bration Program. (11/28-30/62)
P. H. Reinker	Martin-Marietta Baltimore, Maryland	Fission products. (11/29/62)
<u>To Conventions and General Meetings</u>		
W. H. Roos	Olympia, Washington	Governor's Safety Conference. (11/15-16/62)
P. H. Reinker	Washington, D.C.	Atomic Industrial Forum. (11/26-28/62)

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D. VISITORS

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From AEC and Other AEC Operational Contractors</u>		
K. E. Cowser	Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss waste management. (11/6/62)
R. B. Wolf W. Burkhardt M. DeSesa	National Lead Company Fernald, Ohio	Technical information exchange. (Visited U- and T-Plants, Redox) (11/6-7/62)
Justin Bloom	Martin-Marietta Co. Nuclear Division Baltimore, Maryland	Strontium-90 Program and future fission product programs. (11/8-9/62)
J. P. Day L. P. Cushing	Lawrence Radiation Lab. Livermore, California	Plutonium fabrication. (11/20/62)
<u>From General Industry</u>		
J. Booth L. Andrews C. Crocker J. McGoldrich W. Kinney	Brown Johnstone Co. American Sign Spokane Industrial Park Northwest Electronics Techto, Inc. Spokane, Washington	Fission product recovery. (11/5/62)
Norman Jeglum F. P. Rogers	The Sheffield Corp. Dayton, Ohio Seattle, Washington	New developments in gaging field. (11/14/62)
<u>From Other Government and Foreign Agencies</u>		
Jean-Marie Courouble	French A.E.C. Saclay, France	Fission product processing. (11/19/62)
<u>From Other Federal and State Agencies</u>		
D. H. Baker T. A. Henrie	U. S. Bureau of Mines Washington, D.C.	Plutonium purification. (10/23/62)
R. M. Richardson	U. S. Geological Survey Oak Ridge, Tennessee	Waste Management. (11/6/62)

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IV. SAFETY AND SECURITY

<u>Operation</u>	<u>FEO</u>	<u>Finance</u>	<u>WMO</u>	<u>P&GM</u>	<u>Purex</u>	<u>Redox</u>	<u>Prod.</u>	<u>Rel. Prac.</u>	<u>R&E</u>	<u>Total CPD</u>	<u>YTD</u>
Dis. Injuries										1	3
Ser. Accidents				1*						2	2
Med. Treat. Inj.	2		9	15	4	4				34	430
Rad. Occur.			9		3	3				15	181
Contam. Wd.			2			1				3	14
Pu Dep.			2**							2	31
Fires			1***	1****						2	20
Sec. Viol.									1	1	15

* Power and General Maintenance, General Maintenance - T-Plant, 200 West Area - During transfer of empty HAPC Cask I, the crane boom was overloaded, buckled and fell through a fence lighting circuit. No injury was sustained. Replacement boom section cost - \$3,460.95. Electrical repairs - \$50.00.

** These involved less than one (1%) per cent MPBB. They were associated with inhalation.

*** 11-26-62 Weapons Manufacturing, Processing - Room 221, 234-5 Building, 200-West Area - JA Jones employee was welding a hood when heat from welding operation was conducted to plastic shielding (greenhouse) used to confine contamination. The polyvinyl chloride plastic ignited and spread rapidly to surrounding material.
Damage - \$2,315.00

**** 11-26-62 Power and General Maintenance, Power - 284-E Building, 200-East Area - Spontaneous ignition of coal in the silo or in the silo pit.
Damage - \$1,863.00

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V. REPORTS

A. PREPARED AND ISSUED

- HW-71625, Secret, "Process Specification for Critical Mass Control - Purex Plant (Revision No. 3)", dated October 15, 1962, by B. F. Judson and G. C. Oberg.
- HW-74717, Confidential, "Critical Mass Control Specification, 7.35 w/o Pu-Al Alloy Fuel Element Storage - Gas Cylinder Storage Area, 234-5 Building", dated November 2, 1962, by R. J. Sloat.
- HW-74814, Official Use Only, "Project Proposal, Rev. #2, New Waste Storage Tanks - Purex, (Project CGC-945)", dated October 19, 1962, by L. W. Finch.
- HW-74877, Official Use Only, "Project Proposal, Rev. #1, Equipment Disposal - Purex, (Project CGC-964)", dated October 18, 1962, by M. N. Raile.
- HW-74994, Unclassified, "Organic Wash Waste Concentration - 242-T Evaporator Facilities", dated September 19, 1962, by S. R. Bierman.
- HW-75204, Secret AWD, "Project Proposal, Degreasing and Briquetting Facility - RMA Line - 234-5 Building, (Project CGC-990)", dated October 19, 1962, by M. N. Raile.
- HW-75380, Confidential, "Critical Mass Control Specification - Storage of Plutonium Buttons in Vault 106", dated November 1, 1962, by R. J. Sloat
- HW-75444, Secret, "Progress Report - Weapons Process Engineering, October 1962", dated November 5, 1962, compiled by Members of the Weapons Process Engineering Operation.
- HW-75475, Confidential, "Critical Mass Control Specification - Drying of RB Hood Floor Sludge in the Decontamination Hood in Room 221 of 234-5 Building", dated November 9, 1962, by R. J. Sloat.
- HW-75487, Secret, "Quarterly Summary Report and Associated Data for 234-5 Building Final Product Shipped during the Third Quarter of CY 1962", dated November 1, 1962, by A. E. Smith.
- HW-75510 RD, Secret, "Purex Plant Production Schedule - November 1962", dated November 6, 1962, by D. McDonald.

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- HW-75511 RD, Secret, "Redox Plant Production Schedule - November 1962", dated November 6, 1962, by D. McDonald.
- HW-75512 RD, Secret, "UO₃ Plant Production Schedule - November 1962", dated November 6, 1962, by D. McDonald.
- HW-75513 RD, Secret, "234-5 Plant Production Schedule - November 1962", dated November 6, 1962, by D. McDonald.
- HW-75514 RD, Secret, "E-N Loading of NPR", dated November 15, 1962, by V. R. Chapman and J. E. McDonald.
- HW-75517, Secret, "Analysis of Isotopic Exchange Samples 10621 and 10622", dated November 6, 1962, by O. F. Beaulieu.
- HW-75535, Secret, "Evaluation of Process Test 62-3-T - Plutonium Recovery by Recycling to Task I", dated November 9, 1962, by W. F. Unzicker.
- HW-75567 RD, Secret, "E-N Loading of NPR", dated November 12, 1962, by V. R. Chapman and J. E. McDonald.
- HW-75592, Secret, "Trip Report - Savannah River, Rocky Flats, and Idaho Falls", dated November 21, 1962, by J. M. Atwood, D. E. Braden and L. E. Bruns.
- HW-75616, Secret, "Process Specifications for Operational Control-Purex Neptunium Recovery Package", dated November 20, 1962, by J. P. Duckworth and B. F. Judson.
- HW-75629, Secret, "Security of UO₃ Shipment", dated November 21, 1962, by J. H. Warren.
- HW-75649, Secret, "Plutonium Waste from AN7", dated November 26, 1962, by J. H. Warren.
- HW-75665, Confidential, "Scheduled Shutdown - Redox Plant", dated November 28, 1962, by J. H. Warren.
- HW-75693, Secret, "Analysis of Three Batches of 2nd IU Blanket - H Material - September, 1962", dated November 30, 1962, by R. P. Ringle.
- HW-75694, Secret, "Analysis of Three Batches of 2nd E-N Core 0.5 Goal Material - October, 1962", dated November 30, 1962, by R. P. Ringle.
- HW-75732, Unclassified, "Purex Concentrator Corrosion Levels", dated November 30, 1962, by G. C. Oberg.

B. PREPARED FOR SIGNATURE AND ISSUANCE

- HW-75471, Secret, "Production - October, 1962", dated November 1, 1962, by W. E. Johnson.

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VI. PATENT SUMMARY

All persons engaged in work that might reasonably be expected to result in inventions or discoveries advise that, to the best of their knowledge and belief, no inventions or discoveries were made in the course of their work during the period covered by this report, except as listed below. Such persons further advise that, for the period therein covered by this report, notebook records, if any, kept in the course of their work have been examined for possible inventions or discoveries.

INVENTOR

TITLE

NONE

P. H. Linker

General Manager
Chemical Processing Department

DECLASSIFIED

END

**DATE
FILMED**

3 / 18 / 93