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CHEMICAL PROCESSING DEPARTMENT MONTHLY REPORT

OCTOBER, 1962

NOVEMBER 21, 1962

HANFORD ATOMIC PRODUCTS OPERATION

RICHLAND, WASHINGTON

GENERAL ELECTRIC

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HW 75470

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CHEMICAL PROCESSING DEPARTMENT MONTHLY REPORT FOR

OCTOBER, 1962

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Compiled By
OPERATION MANAGERS

November 21, 1962

HANFORD ATOMIC PRODUCTS OPERATION
RICHLAND, WASHINGTON

Work performed under Contract No. AT(45-1)-1350 between the Atomic Energy Commission and General Electric Company.

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TABLE OF CONTENTS

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General Manager, Chemical Processing Department	P. H. Reinker
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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

OCTOBER, 1962

I. SUMMARY

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

	Percent of Forecast Achieved	
	October	Fiscal Year To Date
Separated plutonium nitrate	155.4	109.7
Separated uranium nitrate	121.5	109.0
Uranium oxide	82.0	98.4
Plutonium metal buttons	102.7	82.9
Fabricated parts	80.4	95.6

The production of separated plutonium and separated uranium was highly satisfactory, with both products exceeding forecasted quantities. The previous record high for total separated uranium, established in September 1960, was exceeded by almost seven percent. October production of uranium oxide and fabricated parts was below that forecasted.

The Purex plant operated at an average rate of 28.0 tons per day until October 29, when it was shut down so that the new neptunium facility (Project CGC-821) could be connected to existing process equipment. During the operating period, process performance was excellent. Both products met specifications easily, except for a brief period immediately before the shutdown.

The Purex Plutonium Ion Exchange operated for extended periods at a rate equivalent to a capacity factor of 4.5. Performance was excellent and waste losses were normal.

Installation of the second annular E-metal dissolver (Mark V) was completed at the Redox plant. Operability testing was in progress at the end of the month.

The new neptunium facility at Redox was used for the first time during October. Although the initial runs were recycled because of high uranium content, the fourth attempt yielded a product solution which was satisfactory for final purification. The flowsheet for this equipment is still under development.

The Ion Exchange Facility (Project CGC-978) for recovering plutonium from button line filtrates started operation during October. Although mechanical operation was generally satisfactory, processing performance was characterized by erratic waste losses, which required frequent recycling of the waste. Aggressive efforts to resolve the problem are continuing.

[redacted]

Process design work was completed on facilities needed for recycling out-of-specification plutonium solutions through the Purex ion exchange purification system. The cost of the installation was estimated at $135,000.

The project proposal for design and procurement of an isostatic press for the 234-5 Building was transmitted to the Atomic Energy Commission. The various bids are being evaluated in preparation for procurement action.

Three new projects were approved for the 234-5 Building as follows:

1. AEC Directive No. HW-545 authorized $350,000 for Project CGC-968, "Additional Plutonium Storage Facilities."

2. AEC Directive No. HW-546 authorized $225,000 for Project CGC-983, "Plutonium Ingoting and Auxiliaries Facility, RMA Line."

3. AEC Directive No. HW-547 authorized $75,000 for Project CGC-984, "Electrical and Hydraulic Equipment Mezzanine, RMA Line."

P. H. Reinker

General Manager
Chemical Processing Department

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

OCTOBER 1962

II. ACHIEVEMENTS

A. PRODUCTION OPERATION

1. Production Statistics

	October	Fiscal Year to Date
a. Percent of Forecast(1) Achieved		
Separated plutonium nitrate	155.4	109.7
Separated uranium nitrate	121.5	109.0
Uranium oxide	82.0	98.4
Plutonium metal buttons	102.7	82.9
Fabricated parts	80.4	95.6

b. Purex	October	September
Uranium nitrate produced (tons)	772.43	498.97
Average production rate during operation (T/D)	28.0	21.5
Total waste loss (%)		
Plutonium	0.36	0.54
Uranium	0.24	0.36
On-line efficiency (%)	88.9	77.4

c. Redox		
Uranium nitrate produced (tons)	104.85	112.02
Average production rate during operation (T/D)	6.3	7.6
Total waste loss (%)		
Plutonium	0.56	0.54
Uranium	0.34	0.22
On-line efficiency (%)	71.6	77.9

d. Uranium Oxide (tons)		
Normal UO_3 loaded	581.30	614.85
Enriched UO_3 loaded	121.60	167.76
Normal UO_3 approved for shipment	543.88	595.21
Enriched UO_3 approved for shipment	100.74	149.36
Normal UO_3 shipped	694.31	546.03
Enriched UO_3 shipped	100.15	99.42
Normal UNH backlog	562	339
Enriched UNH backlog	9	52

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

e. Plutonium Metal Processing	October	September
Input to Task I (batches)	239	189
Reduction yield (%)	97.2	93.7
Product recovery output (Kgs)	36.44	25.60
Product recovery backlog (Kgs)	1453.34	1328.04
Waste disposal (grams)	806	310

f. Power	200-East	200-West
Raw water pumped (gpm)	11,163	4,686
Filtered water pumped (gpm)	1,089	814
Maximum steam generated (lbs./hr.)	220,000	110,000
Average steam generated (lbs./hr.)	197,000	87,267
Total steam generated (M lbs.)	146,559	64,927
Coal consumed (tons)	7,515	3,370

The production of separated plutonium and separated uranium was highly satisfactory, with both products exceeding forecasted quantities. The previous record high for total separated uranium, established in September 1960, was exceeded by almost seven percent. October production of uranium oxide and fabricated parts was below that forecasted.

J. N. Warner
Manager - Production

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

OCTOBER, 1962

II. ACHIEVEMENTS (Continued)

B. PUREX OPERATION

1. Operating Continuity

The October production forecast was exceeded. Operation was continuous October 1 through October 28. A one-week scheduled outage began October 29.

2. Processing Operation

Both uranium and plutonium products met specifications except for a brief period at shutdown. The backlog of out-of-specifications plutonium was essentially eliminated.

Strontium recovery series #49, #50, and #51 were completed during October. The use of hydroxyacetic acid in place of tartatic acid as a complexing agent for iron was successfully demonstrated in a process test. This test is one of continuing tests to investigate means of cost reduction.

Double batch precipitation was also tested during the month (Series #50 and #51) to investigate the possibility of reducing the Sr-90 recovery processing time cycle. No advantage was apparent as the time spent on a double run about equaled that required for two single runs.

3. Mechanical Experience

The west tube bundle in the J8 concentrator was found to be leaking during a routine test. A new stainless steel bundle was installed.

A new piping complex incorporating remotely replaceable pipe jumpers was installed at Strontium Semiworks to facilitate loading of fission product shipping casks.

The installation of canyon cell jumpers associated with the neptunium extraction package was completed.

4. Radiation Experience

The total radio-iodine 131 emission for the month was 2.43 curies for a daily average of 0.08 curies. The maximum seven-day emission was 1.51 curies.

[redacted]

5. Analytical Experience

Laboratory flame photometer analytical capabilities were expanded during October. Assay curves and procedures were developed to analyze for sodium in UNH solutions, strontium, magnesium, and potassium.

P R McMurray
Manager - Purex

PR McMurray/JMB/sc

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

OCTOBER, 1962

II. ACHIEVEMENTS (Continued)

C. REDOX OPERATION

1. Operating Continuity

E-metal production from the Redox Plant was 80 percent of the October schedule, despite a significant loss in production rate during the first half of the month. The reduced rate was due to erratic performance of the precycle extraction column feed pump (F-7) and dilute feed solution originating from leaks which developed in the backcycle waste concentrator (D-14) in September and from an operating error early in October. At the end of the month the Redox Plant was again performing well at a rate of about eight tons per day.

The Uranium Oxide Plant operated at satisfactory rates throughout the month. Some interruptions were encountered, viz., 1) the loss of the "L" calciner for about two weeks, 2) a shortage of enriched uranium, and 3) a lack of shipping containers for the normal material.

2. Processing Operations

a. Redox Processing

Production from the Redox Plant was below the October schedule due primarily to the loss of production during the first half of the month. Shutdown periods totaling approximately five days were encountered during the month because of: 1) difficulties with the precycle extraction column feed pump (F-7); 2) the necessity for reworking a large volume of high product waste which had accumulated from the leaking D-14 backcycle concentrator; 3) an operating error involving an over-adjustment of process feed with caustic. Also, the precycle feed rates were restricted to 60-70 percent of nominal until the condensate discharge line from the 233-S Concentration Building was rerouted to the D-12 waste concentrator instead of the H-4 metal solution oxidizer on 10-25-62. This piping revision was necessary because of the change in process flow pattern, which was made during the latter part of September, to bypass the leaking D-14 backcycle concentrator.

Using the new facilities provided by Project CGC-913 for neptunium recovery and decontamination, initial operations were started on 10-19-62 to recover an estimated 2500 grams

of neptunium available in the accumulation system. By the end of the month four removal and decontamination passes had been completed. However, difficulties with the equipment and flowsheet were experienced and a large amount of the neptunium was returned to the accumulation system. Revisions in the flowsheet have been made for use during November runs.

A total of 480 recycle containers of Task I supernatant solution was received from Z-Plant and the solutions were added to the Redox process stream during October.

Five charges of approximately one ton each of IPD test metal were processed through the conventional C-2 dissolver this month and the necessary samples were obtained for conversion ratio determinations. Twelve of the eighteen charges originally scheduled for processing have now been completed through the dissolving step.

b. Uranium Oxide Processing

Processing operations in the Uranium Oxide Plant were satisfactory throughout the month.

3. Mechanical Experience

Although three replacement units were installed during the early part of the month, operation of the F-7 metal solution feed pump continued to give trouble due to leakage at the flange, inability to deliver the desired feed rate, and intermittent plugging. The pump flange leakage was temporarily corrected by installing a shroud around the pump column. However, the plugging still persisted. There was evidence that this was due to foreign material in the tank. Since the pump hold-down studs on the tank had been sheared off years before, the tank was replaced on 10-28-62; subsequent operation of the pump has been satisfactory.

Jumpers were installed this month to route the backcycle scrub salt from the D-9 waste sampling tank to the 1A precycle column. This change will permit operating the columns on essentially the same neptunium recovery flowsheet as provided by Project CGC-913 while by-passing the leaking D-14 waste concentrator.

Installation of the second annular (Mark V) multipurpose dissolver was completed and at the end of the month operability testing was under way.

In the Uranium Oxide Plant, a major breakdown of the "L" calciner, on the depleted UNH stream, occurred on 10-12-62. Subsequent repairs required dismantling the calciner, rebuilding the agitator, and replacing feed points and thermowells. The breakdown was

traced to a broken bolt on the agitator blade. Repairs were completed on 10-31-62 and the unit was returned to service.

4. Waste Handling and Decontamination

Equipment valued at $10,000 was received from the processing plants for decontamination, repair, inspection or burial during the month. Equipment valued at approximately $28,000 was returned to customers, representing a savings of approximately $17,000 over the cost of new equipment.

Three hundred and eight (308) fifty-five-gallon drums of depleted uranium waste from the Dow Chemical Company, Rocky Flats, 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. The maximum dose rate encountered was 4 r/hr at four feet from the concrete burial box. Both equipment moves were completed without incident.

Six skin contamination cases and seven radiation occurrences were recorded during the month. Two of the skin contamination cases were puncture wounds involving plutonium contamination and both employees were surveyed at the Whole Body Counter. One employee had two percent of the maximum permissible plutonium body burden in the area of the wound, but the amount of deposition, if any, has not yet been determined. Bio-assay sampling will continue until a determination can be made.

6. Analytical Experience

The Coolant Systems Development Operation, HLO, was provided with analytical service by the quantitative determination of uranium in a variety of uranium oxide samples from the 100-K reactor coolant system.

Analytical assistance was provided to the Development and Corrosion Chemistry Operation, HLO, in support of the program to develop a procedure for the separation of strontium and cerium from Purex fission product wastes. Multi-channel analysis for strontium and wet chemical analyses for chromium, nickel, iron and aluminum were performed on the submitted samples.

A procedure for the determination of cerium^{144} which uses tetra-n-propyl ammonium nitrate has been developed and is now being evaluated for routine laboratory use. The procedure has also been found to be excellent in decontaminating samples of cerium^{144}, thus making it easier to determine gamma energy analyses of other existing elements.

A fire occurred in the laboratory vacuum pump exhaust system on 10-26-62 and resulted in damage to the gaskets in the duct work, oil separator and exhaust stack system to the extent that replacement of gaskets was necessary. Repair costs are estimated at $300. The investigation indicated that the gaskets and oil film present were probably ignited by a piece of burning petroleum residue which resulted when a carbonaceous material buildup on the exhaust valve of the vacuum pump caused overheating of the valve.

M K Harmon

Manager - Redox

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

OCTOBER, 1962

II. ACHIEVEMENTS (Continued)

D. WEAPONS MANUFACTURING OPERATION

1. Operating Continuity

Model 1251 assemblies were fabricated at rates approximately the same as those of the previous two months. There were no significant interruptions in this work. The production of unfabricated plutonium was curtailed by shortages of product containers for the supernates and by mechanical difficulties. Plutonium recovery activity was limited to skull burning and waste incineration, also as a result of the shortage of product containers. Incinerator operation was normal with mechanical problems causing minor interruptions.

2. Processing Operations

a. Plutonium Fabrication

Information on plutonium fabrication is presented in Document HW-75531 entitled "Chemical Processing Department, Weapons Manufacturing Operation, Z Plant Monthly Report, October, 1962" which is classified "Secret, Atomic Weapon Data, Production Rate and Stockpile Quantity Information."

b. Plutonium Processing

Operation of the plutonium processing line was placed temporarily on a five-day schedule early in the month when product container shortages caused frequent interruptions to the work. The container shortages resulted from the inability of the primary plants to process the supernates at rates equal to those at which the button line generated this material.

The new ion exchange equipment (Hood 46) started handling radioactive process material on October 23. Operations to date have revealed instrument control problems in the acid addition system, and valence state problems with the feed. Both problems are under study at month end.

Incinerator operation improved during the month, and a reduction in the backlog of combustible scrap was achieved.

3. Mechanical Performance

Plutonium fabrication equipment operated well during the period, and it was possible to direct extra effort toward improving this equipment.

3. Mechanical Performance (Continued)

Plutonium processing equipment required excessive maintenance this month. Extensive repairs were required in Hood 9-B on the fluorinator vacuum system, the calciner temperature controls, the hydrofluoric acid system, and the drive to the agitator of vacuum drum filter assembly. In view of the numerous equipment problems in Hood 9-B, plans are being activated to transfer the processing activities to Hood 9-A (now in standby) and perform a complete overhaul on the 9-B equipment.

The incinerator required replacement of the chopper blades twice, and replacement of the burner belt once during the month.

4. Radiation Experience

Control statistics indicate an upward trend in the number of radiation occurrences. A review of the causes of these incidents has resulted in added emphasis on the improvement of workplace surveys.

Three cases of plutonium deposition were experienced during the month (two by puncture wounds and one by inhalation). Initial assays indicate only trace amounts of plutonium are involved in all three cases.

5. Analytical Experience

	September	October
Number of Samples Received	1,774	2,192
Number of Determinations	14,356	19,267
Total Metallic Impurities, Buttons	1,550 ppm	1,044 ppm
Total Carbon Content	390 ppm	315 ppm
Buttons Rejected	5.6%	24.6%
Pu^{240} - NRF Buttons (by Mass. Spec.)	7.58%	7.69%
Pu^{240} - Normal Buttons (by Mass. Spec.)	5.93%	-----
Pu^{240} - Normal Buttons (by Neut. Count)	-----	5.99%

W J Gaulin
Manager
Weapons Manufacturing

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

October 1962

II. ACHIEVEMENTS (Continued)

E. POWER AND GENERAL MAINTENANCE OPERATION

1. Operating Continuity

The supply of steam, water and emergency electrical services to the production facilities continued uninterrupted during the period covered by this report.

2. Inspection, Maintenance and Repair

A two-piece hood and support assembly was fabricated for installation in the Weapons Manufacturing Operation's Inspection facility. The hood will house a Sheffield gauge.

A new D-4-5 dissolver storage tank was mocked up and made ready for the Purex facility. The tank is part of the Purex Reliability Project, CGC-895, and is intended to provide increased storage of dissolver solution.

A spare F-7 vessel (feed tank for precycle decontamination column) was mocked up and made ready for service at the Redox facility. The tank replaced an existing vessel that contained excessive amounts of insoluble solids. Three new F-7 pumps were assembled and delivered to Redox as required to replace three failed units. Failure of the existing pumps was also attributed to excessive amounts of solids in the F-7 tank.

A silver reactor test base was fabricated for installation at the Waste Handling and Decontamination Operation's 221-T facility. The base was required in connection with the flushing, regeneration and testing of reclaimed silver reactor vessels.

A by-pass assembly was installed around the ventilation filter box for the new Q-cell (Palm purification) equipment at the Purex facility. The by-pass will permit changing filters without affecting air balance in the Q-cell hoods.

Sheathing of the spare Purex concentrator continued, and was approximately 75% complete at month's end.

Forty-seven cell-pipe connectors were fabricated during the month.

Installation of the new load-out hood and auxiliary equipment was completed in D-cell of the Strontium Semiworks facility. Included was a dunnage base for the HAPO-I and -II casks. The new equipment

will permit loading of the casks and some maintenance work to be done semi-remotely.

Phase I mock-up was completed on the fifth Stokes vacuum-induction heating furnace recently installed in the A-line at the Weapons Manufacturing Operation. Considerable difficulty was experienced with faulty vendor drawings during the installation. The equipment is presently capable of making "cold" development castings only. Additional work will be required before the equipment can be used for casting plutonium.

Installation of a hood for housing the remote-weighing and density-determining Hadley balance at the Weapons Manufacturing Operation was in progress at month's end. The work, which involves fabrication of one new hood and alterations to another, is approximately 10% complete at this time.

The 2720-E Building, formerly the 200-East Area Patrol Headquarters, is being remodeled to provide office space for AEC personnel. The location of the existing security fence is being changed to exclude the subject building from the secured area. The gate arrangement will be such that, on the day shift, the building can be made accessible to people without area clearances, and returned to Security Patrol on the night shifts, weekends, etc.

A prototype of the waste diverter, designed and used by the British in routing waste fission-product materials to underground storage, was fabricated and installed in an idle portion of the 221-T facility. Facilities Engineering Operation will determine if the design has practical application at HAPO. The English-type waste diverter incorporates a swing-spout arrangement mounted on a center pivot (Print SK-2-19376), which could conceivably replace the pipe connector or "jumper" common to current HAPO design.

No 4 boiler in the 200-East Power House was declared "satisfactory for continued operation" by a Travelers Insurance Company representative serving in the capacity of third-party inspector. The unit was removed from service in September for corrective measures, due to blistered or expanded areas on a number of the water-wall tubes. Repairs and tests have been completed, and the boiler is in stand-by status at this time.

Three hundred and eight 55-gallon drums of depleted uranium, from the Dow Chemical Company at Rocky Flats, Colorado, were unloaded and buried in the 200-West dry-waste trench.

T. S. La Bolletta

Manager
Power and General Maintenance

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

October, 1962

II. ACHIEVEMENTS (continued)

F. FACILITIES ENGINEERING OPERATION

1. Purex

a. Process Design Engineering

Single Cycle Waste Concentration

The single cycle waste concentration test was continued throughout the past month, and the overall performance of the system remains satisfactory. The concentrations of ruthenium and Zr-Nb, in the F-3 Tank are still running above the concentrations normally experienced, but are still within an acceptable range. Readings in both the Sample Gallery and the "U" Cell have leveled off within the past two weeks and have not shown any tendency to go higher.

HAP Gamma Monitor

Installation of electrical components was completed, and satisfactory test operation was obtained. Initial tests were attempted at Purex and operation of the scintillation gamma detection system was obtained. However, the very high gross count indicated a need for more top shielding which is not being installed.

Plutonium Recycle

Process design work was completed on facilities needed for recycle of off-specification plutonium solutions through the Purex "N" Cell purification system. The installation, estimated to cost $135,000, includes facilities for PR can unloading, sampling, chemical adjustment, and transfer to N1, the ion exchange feed tank.

Waste Diverter

Installation of the mock-up of the 241-AX-152 diverter station was completed and initial testing was started. Continuous operation of the mock-up is limited to 15 to 20 minutes by heat-up from the 75 gpm jet; the circulation pump is scheduled for delivery in November.

b. Project Engineering

CAC-945 - New Waste Storage Tanks - Purex

All design drawings have been issued for comments and 38 approved drawings have been issued.

CGC-964 - Equipment Disposal - Purex

The project proposal revision requesting total construction funds of $1,000,000 was approved by Chemical Processing Department on October 31. The bid package is being prepared.

2. Redox

a. Process Design Engineering

Iodine Filter

Design and drawings were completed for iodine filtration in the off-gas stream to the 281 Stack. The unit provides a single flow pass through a 1-inch thick charcoal filter. Critical materials have already been placed on order.

L-2 Concentrator

Recommendations were formulated covering modifications to the existing spare L-2 Plutonium Stripper Vessel to equip it for Brandy concentration service. The changes include bisecting and flanging the tower for easier installation and removal of the packed stripping section. The new L-2 Brandy concentrator design will be held for future application after the existing vessels have been utilized.

Methane Proportional Chamber Amplifier

Initial tests of the prototype system were conducted successfully in the Redox laboratory. Satisfactory alpha counting was obtained from 1700 volts D.C. to 2500 volts D.C. on the methane chamber. Above 2500 volts, the beta counting began. The operating point appeared to be approximately 2200 volts, or approximately the same as with the tube preamplifiers normally used.

b. Project Engineering

CGC-929 - NPR Fuels Processing Facilities

The "A" Cell dissolver installation is complete but has not gone "hot". "B" Cell equipment is ready for installation but is awaiting "A" Cell activation.

c. Manufacturing Engineering

Dissolver Tower

A preliminary process design review of the Redox Dissolver Tower has indicated that the present tower is a limiting factor in dissolution rate. Since there is no need at this

time to increase Redox dissolution capacity, the recommendation was made that the present design be retained, in procurement of a new spare vessel, with a review for mechanical improvements only. When future production needs require additional dissolution capacity, a process review can be made to investigate the feasibility and economics of installing a new tower.

D-14 Concentrator

Unexpected early failure of the Redox D-14 Concentrator prompted the initiation of an exhaustive investigation into the cause of the failure. Television was used to survey the vessel and associated cell equipment; and, although the leak was not discovered, failure of the vessel-supporting structure was observed. Further study will be possible after the scheduled removal of D-14 Concentrator on November 3, 1962.

Nine (9) jumpers were designed and fabricated to bypass the D-14 system and to permit plant operation to continue while methods of repairing the cell equipment were studied. The bypass system has been operating satisfactorily for several weeks.

3. Weapons Manufacturing

a. Process Design Engineering

Incinerator

Design of insulation for the ash canning end of the furnace has been completed. The design employs a series of heat-reflecting aluminum plates. Estimates for cost of fabrication are being obtained. Two (2) furnace conveyor belts, one made of Nichrome V and one of Monel, have been ordered for test and evaluation under actual operating conditions.

RMC Button Line

The mechanical design for a calciner "blowback" filter for the off-gas line has been completed. Prints have been submitted for criticality approval and fabrication has been started.

A decision was made to replace the existing prototype HC-26 ingoting hood which has deteriorated to the degree that it is no longer satisfactory production equipment. The newly-designed glove box has three ingoting stations and space for one additional station. Also, this larger box has more area available for make-up and break-out of the ingoting mold. The unit is now being fabricated in CPD Shops.

Isostatic Press

The project proposal for design and procurement of the isostatic press for 234-5 Bldg., has been transmitted to the Commission. The various bids are being evaluated, with specific assistance from other components of the Company. It is expected that an order can be placed as soon as funds can be authorized.

New RMA Fabrication Line Equipment

Scoping and definition of the new fabrication equipment for the RMA Line have progressed to the state that a combined scope document will be issued early in November. Determinations have been made on five steps; casting, mold make-up and break-out, ingoting, density measurement, and degreasing and briquetting. The scope document is being issued for comment.

b. Project Engineering

CAC-880 - Plutonium Reclamation Facility - "Z" Plant

Preparation of the Phase II bid package has been started. The over-all construction status chart for this project has been approved and returned by the Commission.

CGC-978-RMC Button Line Filtrate Handling Facility-"Z" Plant

Beneficial use of this facility was achieved on 10/17, approximately one month early. The facility went on stream on 10/26. Experience to-date indicates the facility to be mechanically operational as designed. Instrumentation is being refined to correct difficulties in automatic control of feed stream. In addition, it has been decided to install a new product "bank tank" of increased capacity to facilitate operational flexibility of the facility during column stripping.

New Project Authorizations

Three new projects for the 234-5 Bldg., were authorized:

CGC-968-Additional Plutonium Storage Facilities-234-5 Bldg., by AEC Dir. HW-545, dated 10/1/62, for $350,000.

CGC-983-Plutonium Ingoting and Auxiliaries Facility-RMA Line, 234-5 Bldg., by AEC Dir. HW-546, dated 10/10/62, for $225,000.

CGC-984-Electrical & Hydraulic Equipment Mezzanine - RMA Line 234-5 Bldg., by AEC Dir. HW-547, dated 10/10/62, for $75,000.

4. General

a. Process Design Engineering

Waste Tank Leak Detection

Process design work was completed for leak detection networks covering the 200-East and West Areas' waste tanks. Agreement has not been reached, however, on the need and justification for the proposed system. The "data gage" system is now in operation in the 113-SX Tank. Final electrical connections and subsequent system operation were obtained without incident. Leak checking the 113-SX Tank began on October 10, when 63,000 gallons of wastes were transferred from 241-SX-114.

"B" Plant - Phase II

Project cost estimates were made on the proposed high efficiency installation for the 221-B exhaust stream (75,000 cfm). The filters would be buried in a concrete cell outside the building and would remain buried after being removed from service. The cost of the filter cell with two filter banks in series is approximately $50,000. The fibrous glass filter installation, as originally planned, would cost approximately $800,000. Related building and equipment requirements would cost an additional $300,000, in either case.

b. Project Engineering

Project Cost Information - as of 10/21/62:

Total Authorized Funds-20 active projects	$11,910,000
Total Cost-to-date	9,311,000
Commitments and Open Work Releases	593,000
Unencumbered Balance	2,006,000
Costs Charged to Above Projects 9/23/62-10/21/62	353,000

c. Manufacturing Engineering

Fabrication Shops Improvement Program

Assistance was given in the equipment portion of this program. It proposes the acquisition of 49 pieces of machine tool equipment between 1963 and 1967, at an investment of $739,000.

[redacted]
Manager - Facilities Engineering

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

OCTOBER, 1962

II. ACHIEVEMENTS (Continued)

G. RESEARCH AND ENGINEERING OPERATION

1. Purex Process Engineering -

a. Head-End

A series of plant tests to reduce plutonium and uranium losses to the coating waste solutions by increasing the volume of the final fresh water rinse from 400 to 1000 gal. were completed with no appreciable beneficial results. Heating the rinse water to boiling reduced the waste losses by about 25 per cent, but required a one hour increase in the overall dissolver time cycle. Other tests using cold water and two 500-gallon rinses showed no improvement in waste losses.

b. Solvent Extraction

Process performance was excellent until shutdown of the plant on October 28 for planned maintenance work. Recovery and decontamination performance of the First Decontamination Cycle remained excellent, with losses via the HA Column Waste Stream (HAW) averaging less than 0.03 per cent and activity of the product streams (ICU and IBP) remaining essentially constant until pulse generator power failures upset the system during the final three days of the operating period. Approximately 1000 gal. of high level wastes (IWW) and 3000 gal. of recovered, digested waste material (F8) were successfully reworked through the solvent extraction system during the month. No adverse effects were noted from the IWW rework, but a general upward trend in both the HAW losses and the activity of the First Cycle product streams was experienced during rework of the digested waste material. The decontamination performance of the Second Plutonium Cycle improved four to six-fold (to 5000-6000 DF) during the month with no significant change in either operation or flowsheet variables, other than an apparently tightened dispersion in the scrub section. Performance of the Final Uranium Cycle continued to be generally excellent until the loss of pulse from a power failure flooded the 2E Column and contaminated several batches of uranium product with organic.

c. Neptunium Recovery

Neptunium accumulation in the Backcycle Waste System (3WB Stream) was normal, with losses averaging approximately 20 and 5 per cent in the HA Column Waste (HAW) and the 2E Column Product (2EU) streams, respectively.

d. Final Plutonium Recovery

Following valve maintenance and resin changeout on October 9, operation of the Plutonium Ion Exchange Unit was excellent for the remainder of the month. As a result of extremely high plutonium rework through the plant, the unit operated for extended periods at an equivalent plutonium rate of CF = 4.5 with essentially normal losses. On October 18, sodium fluoride addition to the XA Column Feed Stream (XAF) was stopped because of the low activity levels in the Final Plutonium Cycle Product Stream (2BP). Although the ion exchange decontamination factor decreased from about 35 to 8, the plutonium product still remained within shipping specification.

e. Solvent Treatment

Successful use of Na_2CO_3-$KMnO_4$ as a solvent washing agent in the No. 2 Solvent Treatment System has permitted the reuse of all No. 2 System washes in the No. 1 Solvent Treatment System, with a resulting 50 per cent reduction in the volume of organic wash solutions and 30 per cent reduction in solvent losses. Organic wash wastes currently average about 300 gal/TU.

f. Acid Recovery and Waste Concentration

The Single-Stage Acid Recovery Test was continued during the month. The recovered acid activity increased by a factor of two with ruthenium activity reaching about 1×10^5 uc/gal and ZrNb about 2×10^4 uc/gal. Peak periods for both species occurred following periods of either High Level Waste (IWW) or Recovered Digested Waste (F8) rework. An increase in activity also resulted from decreasing the IWW rate from 7.5 to 6.5 flows near the end of the month to facilitate fission product recovery. A reduction from 0.01 to 0.0065 M in the sodium nitrite in the feed to the High Level Waste Concentrator (E-F6) produced an immediate factor of two increase in the ruthenium activity in the recovered acid with essentially no change in ZrNb activity. No noticeable decrease in ruthenium activity was achieved by reestablishing the original nitrite concentration.

g. Fission Products

Purex fission product recovery equipment was engaged in strontium recovery runs throughout the month. Hydroxyacetic acid was successfully tested as a substitute for tartaric acid to complex iron in the sulfate precipitation step, and its continued use will reduce the chemical costs of the strontium recovery process by over 40 per cent.

The cake dissolution volume in the sulfate step was reduced 25 per cent to permit increasing the number of sulfate runs per series from five to six. A standard strontium recovery run series now consists of six sulfate precipitations, two oxalate precipitations, and one concentration precipitation.

2. Redox Process Engineering

a. Dissolvers

The second in a series of coating removal tests was conducted to determine the maximum initial concentration of sodium hydroxide that can be tolerated in the dissolved waste sludge to be used as a hydrogen suppressant during coating removal. The possibility of blending salt waste solution (1.0 - 2.0 M NaOH, 7 - 9 M $NaNO_3$) with dissolved waste sludge (0.3 M NaOH, 4.2 M $NaNO_3$) is being considered. At the start of this test the jacketed slugs were covered with a solution of 0.9 M NaOH and 3.5 M $NaNO_3$ composition. A vigorous reaction occurred at about 75 C which resulted in a higher than normal pressure drop across the dissolver tower. The reaction was controllable, short in duration, and did not result in loss of the dissolver vacuum.

b. Solvent Extraction

The necessary equipment changes were made to by-pass the failed Backcycle Concentrator (D-14) and still retain the HS Column for neptunium accumulation and recovery. With the present flow pattern, the HSW stream is routed to the former Centrifuge Feed Tank (G-5) and then returned to the HAFS Concentrator (H-4) where it is concentrated with uranium metal solution from the dissolver to produce HAFS feed solution. Additional salt in the form of concentrated waste (D-9) is pumped to the HA Column as required. With this new flow pattern, the capacity of the H-4 Concentrator limits rates to about 9 tons per day, and flexibility for reworking high waste batches while operating is reduced.

Since September, the 1A Column has been operated with the entire 1AA stream (1.3 M ANN, 0.5 M HNO_3) being introduced near the midpoint of the scrub section. This flowsheet change was intended to maintain a 0.05 M HNO_3 concentration in the organic phase in the 1A Column scrub section and overflow line, thereby reducing the potential for plutonium deposition. Four subsequent ten percent acid flushes of the 1A Column have dissolved 80, 115, 110, and 90 grams of plutonium. These amounts of plutonium pickup indicate that, although the rate of plutonium deposition has decreased by a factor of two, it has not been completely eliminated. Piping changes are being completed to introduce an acidified organic stream into the bottom of the scrub section. This change will provide a more direct control of the acid concentration in the organic phase of the 1A Column scrub section and will permit returning the 1AA stream to the top of the scrub section.

A test of a 2A Column oxidizing flowsheet was conducted in which sodium dichromate was introduced into the 2A Column via the 2AS stream. Oxidation and recovery of the plutonium in the 2A Column was poor with about ten percent of the plutonium fed to the column being lost via the 2AW stream. Approximately six percent of dichromate in the 2AS stream was extracted with the plutonium and was

sufficient to oxidize all the ferrous ion in the XAF Adjustment Tank (E-3), thus preventing the reduction of the plutonium to the tetravalent state. The presence of hexavalent plutonium in the feed to the L-18 Plutonium Anion Exchange Unit resulted in higher than normal plutonium recycle in the XAW stream. Development of a satisfactory 2A oxidizing flowsheet will require provision of facilities for introducing the oxidant into the column with the feed stream.

c. Neptunium Recovery

Initial flowsheet development tests were undertaken using facilities provided by Project CGC-913 for neptunium recovery and decontamination. Three neptunium removal passes were made using water to strip the neptunium from the HS Column. The amounts of neptunium removed from the accumulation system with these three passes, 315, 525, and 260 grams, respectively, ranged from 60 to nearly 100 percent of that in the feed. However, the uranium and nitric acid content of the recovered neptunium were high, complicating subsequent purification. In order to keep the uranium and nitric acid from being stripped out of the HS Column along with the neptunium product, a fourth neptunium run was made using a salted stripping solution (1.30 M ANN, 0.07 M ferrous ammonium sulfate and 0.05 M sulfamic acid). Near 100 percent removal efficiency was achieved during the first few hours of stripping operation. However, the ferrous ion concentration in the stripping solution was slightly lower than that required to maintain neptunium in the tetravalent state, and thus resulted in neptunium reflux in the lower portion of the HS Column stripping section and a loss of stripping efficiency to about 10 percent. With the salted stripping solution, the acid concentration in the 1SPB neptunium product stream was less than 0.05 M HNO_3; however, the uranium decontamination was not significantly improved over that obtained with water. Further removal runs will employ water stripping in the HS Column, and precautions will be taken to avoid uranium contamination of the HSF stream.

Recovery of neptunium in three of the four decontamination runs through the 3A Column was poor with 70 to 90 percent of the neptunium being returned to the accumulation system as a 3AW waste loss. The poor recovery was the result of failure to attain the desired acidity in the 3AF Feed Tank (E-1) and in the 3A Column. The neptunium product recovered in these three runs contained a three to six-fold excess of uranium (30 to 60 parts by weight of U per part Np) and was also returned to the accumulation system. On the third pass the concentration of acid in the 3AF and 3AS streams was adjusted to 0.5 M HNO_3 and 0.2 M HNO_3, respectively. Essentially 100 percent recovery was achieved across the 3A Column and the final product solution was acceptable for the final purification step.

3. Plutonium Process Engineering

a. Metal Finishing Operation

1. Button Line

Button densities increased significantly during the month. Densities for the last three weeks of the month averaged XX-32. Higher densities were caused by the following:

(a) Correction of abnormally high temperatures (200° C) in the oxalate calciner, which had been caused by faulty instrumentation.

(b) Reduction of the amount of aluminum complexed recycle (MR) feed in the solution fed to the oxalate precipitation step. Aluminum complexed solution blends in the feed were kept at a maximum of approximately seven percent.

(c) Less interruption of production.

2. Skull Dissolution

Currently, fabrication skulls are burned to the oxide, then dissolved in 16 M HNO_3-0.1 M HF in glass dissolvers. To minimize corrosion, the solution had been complexed with aluminum before blending with the Redox and Purex feed solutions. Hanford Laboratories data indicated that acceptable corrosion rates could be attained in the line without aluminum complexing if the solutions are kept below 25° C. Consequently, a geometrically favorable heat exchanger has been installed to cool solution from three of the six dissolvers. Direct processing of MR solution without aluminum complexing is now possible.

3. CGC-978 - Ion Exchange Facility

Construction of the CGC-978 Ion Exchange Facility has been completed and initial start-up activities have begun. By month-end, approximately one kilogram of plutonium had been collected from the treated filtrates from the button line. Waste losses during the initial operating period have been erratic, with frequent losses high enough to require recycling. Preliminary investigations indicate that the high losses are caused by the presence of plutonium in the six valence state. Presumably, the plutonium-six is present because of inadequate prereduction in the button line.

5. Recuplex Deactivation

Solutions remaining in the Recuplex facility were analyzed for corrosion potentiality. No serious corrosion areas were found. All cribbable solutions have been cribbed and all product solutions have been loaded out for Task I or parent plant processing. Work is in progress concerning removal of plutonium from remaining highest inventory areas: (a) the plutonium product stripper-concentrator, J-26-A, and (b) slurry on the reception-blending hood floor.

With time, the plutonium solids in J-26-A (a 4-inch packed column -- 1-inch teflon rings) have settled and plugged the concentrator-stripper. Initial attempts to remove the plug with boiling nitric acid have proven unsuccessful. Planned procedure variations (e.g., generation of slight pressure below the plug) should speed the plutonium removal from J-26-A. The slurry from the RB hood will be removed in liter portions and dried in a new drying hood (under construction) for safe storage and later processing in the CAC-880 facility.

6. Z-9 Crib

Sampling of the soil in the Z-9 crib was resumed. Previous sampling penetrated two feet below sump surface level. Present sampling will attempt penetrations five feet below the surface. First attempts located a 6-inch thick, dense, hard layer below the 2-foot depth. New equipment is being obtained and installed before 5-foot deep cores can be successfully removed from the crib bed.

4. Separations Chemistry Laboratory

a. Purex Process Assistance

The possibility of storing 241-A-103 supernatant liquid in the 241-C-103 tank on top of 8 inches of sludge in that tank has been investigated. The sludge appears to be a cake removal sludge which, if intimately mixed with the new supernatant, would remove 15 to 20% of the radiocesium. Also if the sludge were suspended in the supernate it could pass the SS screens to the STT on subsequent processing. However, the sludge settles reasonably well and can be washed from decalso, so there appears a reasonable chance that the tank can be used as is for storage of the 103-A supernate.

The use of hot water washes of the dissolver heels prior to cake removal in the Purex dissolvers has shown some reduction in waste losses but at the expense of an undesirable increase in time cycle. Some alternate methods of reducing waste losses are being considered.

Alamine, which is a tertiary amine being considered in a process for Pu and Np recovery from Purex 1WW, was evaluated for its effect on Purex solvent. Concentrations up to 0.01% alamine in Purex solvent showed no detrimental effects as determined by plutonium retention measurements.

b. Redox Process Assistance

Acid boil-off as a means of adjusting UNH acidities was investigated to measure some of the conditions that could exist. With a 7.8 M UNH solution (based on 25 C) and a range of acid deficiency from 0.2 to 1.0 M and with a boil-off rate of 2% of total volume per minute, the condensate was found to be 1 M in nitric acid. On a solution of UNH of 7.8 M and at an acid deficiency of 1.5 M HNO_3 (based on 25 C) the boiling range was found to be between 150-162 C and the freezing point between 119-130 C.

The possibility of using ferrous sulfamate for valence state adjustment of Pu feed to the ion exchange column was investigated by determining the half-life of ferrous sulfamate in 7 M HNO_3 at 60 C. The half-life by spectrophotometric methods was found to be 13 minutes which should be adequate to permit its use.

PRTR fuel elements to be included in the first recovery campaign at Redox have been designated. A meeting was held to point out, and where possible, to eliminate processing and analytical difficulties. As a result, the fuel elements have been scheduled for dissolution and processing in such an order that the Pu^{240} to Pu-total ratio will be held constant. This will permit analytical control of the process by alpha counting techniques.

c. Hot Semiworks Assistance

Precipitation of strontium from the tank 64 contents has been improved by digesting the material in 2 M HNO_3 and 2 to 3 M H_2O_2 for about four hours.

d. Laboratory Assistance

A procedure was devised for determining the total zirconium in an oxalate solution. After destroying the interfering oxalate with permanganate in a sulfuric acid matrix, the solution was clarified with hydroxylamine. The zirconium concentration was then measured on the spectrophotometer after developing the blue pyrocatechal violet complex at pH 5.1.

A spectrophotometric uranium analysis has been evaluated for use as a secondary check of the coulometric analysis used on the Purex dissolver solution composite. This method will provide a cross check for the uranium values found on the September and October composites. While the method will be no more accurate than ± 2%, gross deviation of 6-10% can be detected.

Work was continued on the evaluation of the X-ray spectrometer for chloride analysis. A new calibration curve was prepared using NaCl as the source of chloride. To test the effects of the presence of a high atomic number element on the calibration curve, a series of $BaCl_2$ standards were run. Recoveries on $PuCl_3$ were found to be too high. Substitution of U for Ba will be done to improve performance.

The analysis of the depleted and enriched uranium fission foils, exchanged between ANL, LASL, and HAPO has been completed. The results of the determination of the $MoTc^{99}$ content of the foils were reported this month and they compare favorably with the previously reported $BaLa^{140}$ analyses. Tabulation of the total program results have not as yet been received from ANL.

Seven sets of eight irradiation foils were analyzed at Redox and sent to participating sites of the "Irradiation Effects on Structural Materials" committee. These foils are part of an intercalibration program. Six participants had reported their analyses in time for presentation of the comparative results to the full committee on October 16. Results between sites are not in agreement, therefore a questionnaire has been prepared and submitted to each participant, to aid in the interpretation of the data. In addition, the full committee approved a future meeting of the personnel directly connected with activity analysis.

A PuO_2 sample from the Plutonium Chemistry Laboratory, which had shown 99.51% reactivity, was rerun to resolve the question of its high volatility content. The thermogram up to 1000 C showed a definite break at 300 C perhaps due to nitrate and water. Another break occurred at 550 to 675 C which may have been due to sulfate content.

5. Plutonium Chemistry Laboratory

a. Direct Calcination of Plutonium Nitrate

The volatile constituents in screw-calciner oxide have been shown to consist of sulfate and residual nitrate.

A thermogram was run on the product of run SC-6, for which the feed contained 0.5 mole sulfate per mole plutonium. The thermogram showed a weight loss of 26 per cent upon heating to 300 C. Analysis showed that this loss was due to nitrate decomposition. No further reaction occurred until 550 - 675 C, when a 9.7 per cent loss occurred. This corresponded to the expected evolution of SO_3. No further loss occurred up to 1000 C in air.

These anionic impurities are completely removed during chlorination.

b. Electrolytic Reduction of Plutonium Trichloride

Equipment modification and temperature studies now permit comparison runs under uniform conditions.

Addition of a graphite susceptor and ceramic insulation external to the cell basket has been made in order to smooth out the temperature profile of the cell. A cell lip temperature of 900 C was shown desirable in order to minimize foaming. One of the subsequent runs lasted 10.5 hours.

The $BaCl_2$ - KCl melt was shown to have about the same resistance in electrowinning as the LiCl- KCl melt. This surprising result was obtained while comparing the two melts as to foaming tendency. Little difference was observed.

F. L. Frank

Manager
Research and Engineering

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

OCTOBER, 1962

II. ACHIEVEMENTS (Continued)

H. FINANCIAL OPERATION

1. Production Cost

Cost transfers between departments, manpower, and overtime schedules were completed for the FY 1963 Midyear Budget Review and forwarded to Contract and Accounting Operation for consolidation. Also, all section budgets were completed and reviewed with section and subsection managers during the month.

A study of Isotope Inventory costs for FY 1963 was completed this month resulting in the establishing of a price of $1.20 per curie compared to $2.04 in FY 1962.

An analysis of weapons billings to Rocky Flats in FY 1963 was completed and a major correction in billing rate communicated to C&AO for action.

Special requests processed for billing during the month included material and shipping costs of the following plutonium metal shipped offsite:

2.8 Kg's for Euratom Supply Agency, Belgium
1.0 Kg for Battelle Memorial Institute
3.5 Kg's for NUMEC
2.0 Kg's for Monsanto Chemical

In addition, costs were accumulated for fabrication of six birdcages for AEC and for the burial of 308 drums of contaminated material for Dow Chemical Company.

CPD's investment in inventories at September 30, 1962 compared with budgeted amounts is as follows:

(in thousands)	Balance 9-30-62	Control Allocation	Surplus (Deficit)
Inventories			
Essential Materials	$ 830	$ 832	$ 2
Spare Parts & Standby	1 708	1 400	(308)
Special Materials	121	100	(21)
Gross Inventories	2 659	2 332	(327)
Reserves			
Essential Materials	61	62	(1)
Spare Parts & Standby	748	350	398
Total Reserves	809	412	397
Net Investment	$1 850	$1 920	$ 70

2. Personnel Accounting

Resumes of pension benefits were completed and discussions held with three employees this month. Two of these employees are nearing retirement and one is being removed from the payroll for disability reasons.

3. Auditing

A formal audit report was issued in October in connection with the audit of budgeting and forecasting, and the execution of these two activities.

Audit work continued on material and package pass control, Equipment Work In Progress and Construction Work In Progress.

4. General Accounting*

As of September 30, 1962, seventeen active projects had incurred costs of $9,038,374 against authorized funds of $11,334,200. Outstanding commitments totaled $572,058.

During October, one modification and three directives were received from the AEC: Modification No. 4, Directive No. HW-475, Project CGC-811, Additional Plutonium Fabrication Facilities - 234-5 Building, decrease in funds of $100,000, total authorization $3,895,000; Directive No. 545, Project CGC-968, Additional Plutonium Storage Facilities - 234-5 Building, authorized funds $350,000; Directive No. HW-546, Project CGC-983, Plutonium Ingoting and Auxiliaries Facility - RMA Line - 234-5 Building, authorized funds $225,000; Directive No. HW-547, Project CGC-984, Electrical and Hydraulic Equipment Mezzanine - RMA Line - 234-5 Building, authorized funds $75,000.

During October, 1962, three appropriation requests were approved which authorized expenditures of $37,500 as follows:

AR Number	Description	Section	Amount
36012	Hollow Spindle Lathe	P&GM	$31 000
36015	Averaging Device - Sheffield Gage	WMO	4 500
36016	Cave Manipulator	Redox	2 000
	Total		$37 500

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

Manager - Finance

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

OCTOBER, 1962

III. PERSONNEL ACTIVITIES

A. FORCE SUMMARY

Operation	Monthly Salaried 9-30-62	Monthly Salaried 10-31-62	Weekly Salaried 9-30-62	Weekly Salaried 10-31-62	Total 9-30-62	Total 10-31-62
General Manager's Group	11	11	2	2	13	13
Financial	13	13	15	15	28	28
Research & Engineering	62	61	28	28	90	89
Facilities Engineering	61	60	21	21	82	81
Power & General Maint.	38	38	244	245	282	283
Production	6	6	4	4	10	10
Redox	49	57	200	240	249	297
Purex	64	64	247	249	311	314
Weapons Manufacturing	54	52	260	222	314	273
Total	358	362	1021	1026	1379	1388

B. PERSONNEL CHANGES

Effective October 1, 1962, James W. Fillmore was transferred from Specialist, Maintenance, Planning, and Scheduling, Maintenance Operation, to Manager, Uranium Oxide Operation. On this same date the Uranium Oxide Operation was transferred from Finished Products Operation to Redox Operation, and Finished Products Operation was renamed Weapons Manufacturing Operation.

C. TRIPS

Visitor	To	Nature of Discussion
To Other G.E. Components		
F. S. Stong	APED San Jose, California	Gamma monitor tests. (10/1-4/62)
P. H. Reinker	New York, N.Y.	Business planning. (10/4-5/62)
R. B. Britton	New York, N.Y.	Employee relations meeting. (10/8-12/62)
R. W. Bryant	Schenectady, N.Y. Louisville, Ky.	Suggestion systems. (10/19-29/62)
P. H. Reinker	Palo Alto, Calif.	Business planning. (10/31, 11/1-2/62)
To AEC and Other AEC Contractors		
P. H. Reinker	US-AEC Germantown, Md.	DOP Management meeting. (10/2-3/62)
R. H. Bond R. S. Kingsley	Los Alamos Scientific Lab. Los Alamos, N.M.	Plutonium recovery. (10/15-16/62)
J. B. Fecht J. B. Kendall H. C. Rathvon S. G. Smolen	Union Carbide Nuclear Co. Oak Ridge, Tenn.	Fission product program. (10/22-23/62)
L. I. Brecke P. B. Fisk L. M. Knights	Dow Chemical Co. Rocky Flats Plant Denver, Colo.	American Soc. for Quality Control. (10/24-27/62)
D. E. Braden L. E. Bruns	du Pont Co. Aiken, S.C.	Solvent extraction and plutonium recovery (10/29-30/62)
	Dow Chemical Co. Denver, Colo.	" (10/31/62)
	Phillips Petroleum Idaho Falls, Idaho	" (11/1/62)
W. S. Frank H. P. Shaw	US-AEC Germantown, Md.	Fission product recovery. (10/29-31/62)

C. TRIPS (continued)

Visitor	To	Nature of Discussion
To AEC and Other AEC Contractors (continued)		
C. A. Lyneis A. E. Smith	US-AEC Albuquerque, New Mexico	Management meeting - fabrication methods. (10/29-31/62)
	Los Alamos Scientific Lab. Los Alamos, New Mexico	
To General Industry		
G. P. Kesel	Allied Engineering and Production Corp. Alameda, California	Fabrication of equipment. (10/9-10/62)
	Northwest Copper Company Portland, Oregon	Fabrication of hood. (10/11/62)
R. C. Hollingshead	Ex-Cell-O Corp. Detroit, Michigan	Design of numerically-controlled lathes. (10/22-25/62)
W. P. Ingalls W. H. Koontz	Consolidated Western Steel Co. San Francisco, Calif.	Discuss bid package. (10/29-31/62)
A. E. Barber	Sheffield Corp. Dayton, Ohio	To check on tool design and measurements. (10/1/62)
	Speer Carbon Co. St. Marys, Pa.	Consultation on graphite mold production. (10/2/62)
To Conventions and General Meetings		
R. W. Bryant	New York, N.Y.	National Assn. of Suggestion Systems. (10/18/62)
J. B. Fecht J. B. Kendall H. C. Rathvon	Gatlinsburg, Tenn.	Solvent extraction symposium. (10/23-26/62)
J. S. Buckingham W. H. Zimmer	US-AEC Chicago, Ill.	Present paper. (10/3-5/62)

C. TRIPS (continued)

Visitor	To	Nature of Discussion
To Conventions and General Meetings (continued)		
R. S. Rosenfels	Seattle, Wash.	American Ceramics Soc. (10/17-19/62)
R. J. Kofoed	Gatlinsburg, Tenn.	Spectroscopy conferences. (10/9-11/62)
G. O. Ager	Chicago, Ill.	National Safety Congress. (10/25/62)
To Colleges and Universities		
W. Watson	Univ. of Oklahoma Oklahoma City, Okla.	Recruiting (10/2-10/62)
	Univ. of Texas Austin, Texas	"
C. W. Smith	Univ. of Texas Austin, Texas	Fission product cask testing (10/29-30/62)
To Other Government and Foreign Agencies		
R. E. Tomlinson	Vienna, Austria	IAEA Symposium Present paper. (10/8-13/62)
	Eurochemic Mol, Belgium	Separations and waste treatment. (10/18-19, 31/62)
	AERE Risley, England	" (10/22/62)
	AERE Harwell, England	" (10/23/62)

D. VISITORS

Visitor	From	Nature of Discussion
From Other G. E. Components		
A. B. Carson J. L. Michaelson	General Engineering Lab. Schenectady, N.Y.	GEL Services (10/10/62)

D. VISITORS (continued)

Visitor	From	Nature of Discussion
From AEC and Other AEC Operational Contractors		
T. E. Philbeck P. M. Pitts L. E. Weisner	du Pont Savannah River Plant Aiken, S.C.	Process control instrumentation. (10/8/62)
H. E. Weber	US-AEC Albuquerque Oper. Off. Albuquerque, N.M.	Plutonium fabrication. (10/10/62)
H. Hull	du Pont Wilmington, Delaware	Waste management and fission product processing. (10/10-11/62)
H. Katz	Brookhaven Nat. Lab. Upton, L.I., N.Y.	
P. R. Moore	du Pont Savannah River Plant Aiken, S.C.	Separations processes. (10/15/62)
T. E. Harrington W. G. Stockdale	Oak Ridge National Lab. Oak Ridge, Tenn.	Dissolver designs, soluble poisons, criticality limits, Purex equipment and operating efficiency. (10/18-19/62)
M. E. Harris H. F. Rizzo	Lawrence Radiation Lab. Livermore, Calif.	Consultations on plutonium fabrication. (10/16/62)
From General Industry		
A. H. Gustaferro G. J. Verbeck	Applied Research PCA Chicago, Illinois	Discuss concrete testing program. (10/1/62)
Larry Mathews	PCA Field Engineer Yakima, Wash.	"
H. W. Birkeland	Anderson-Birkeland-Anderson Tacoma, Wash.	241-AX tank construction. (10/10/62)
F. T. Barr H. G. Corneil	Esso Research & Eng. Co. Linden, New Jersey	HAPO waste management and fission product recovery. (10/15/62)

[redacted]

D. VISITORS (continued)

Visitor	From	Nature of Discussion
From General Industry (continued)		
Paul Berner	Star Machinery Seattle, Wash.	Discussions on new lathe concepts. (10/15/62)
Howard Schroc..	Ex-Cell-O Corp. Los Angeles, Calif.	Discussions on new lathe concepts. (10/15/62)
R. S. Ebbert	General Automation Troy, Michigan	General discussion of core drilling. (10/16/62)
E. Vynne	Cascade Distributors Seattle, Wash.	"
From Other Government and Foreign Agencies		
C. Allday F. Butler T. N. Hughes D. F. Warner	UK-AEA Windscale, England	Plutonium technology. (10/18/62)

[redacted]

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

OCTOBER, 1962

IV. SAFETY AND SECURITY

Operation	FEO	Finance	WMO	P&GM	Purex	Redox	Prod.	Rel. Prac.	R&E	Total CPD	YTD
Dis. Injuries											3
Ser. Accidents											1
Med. Treat. Inj.			4	18	11	6				39	397
Rad. Occur.			11		3	7			1	22	166
Contam. Wd.			2			2				4	11
Pu Dep.			14							14*	29
Fires			2**			1***				3	18
Sec. Viol.	1									1	14

* All of these involved less than one (1%) per cent MPBB. Ten were associated with lack of containment of a plutonium atmosphere resulting in inhalation.

** 10-20-62 Weapons Manufacturing Operation, Processing - 234-5 Building, 200-West Area -

(1) A short in thermal induction wire ignited insulation on pipe. Damage - $10.00.

(2) Pyrophoric metal stored in cardboard carton in vault, ignited spontaneously. Damage - $400.00.

*** 10-26-62 Redox Operation, Analytical Control - 222-S Building Pump Room, 200-West Area -

Exhaust valve leaked in conjunction with excess amount of oil from vacuum pump which caused valve to become coated with varnish which, in turn, caused it to leak more. Leakage resulted in overheating. Hot carbon particles probably dislodged from valve and ignited oil residue in duct on down stream side of pump. Damage - $296.00.

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

OCTOBER, 1962

V. REPORTS

A. PREPARED AND ISSUED

HW-52011 REV, Secret, "Estimation of SS Material Hold-Up in Process Lines and Columns at Redox", dated October 12, 1962, by R. G. Barnes.

HW-73491, Confidential, "Continuous Electrorefining of Plutonium Progress Report", dated October 5, 1962, by T. S. Soine.

HW-74426, Unclassified, "Purex N-Cell Sump Stabilization", dated July 27, 1962, by W. A. Graf.

HW-74626 RD, Secret, "Preliminary Review of CPD Thorium Processing Potentials", dated October 8, 1962, by G. Rey (prepared for Advance Technical Planning).

HW-74694, Secret AWD, "Preliminary Project Proposal - Metal Stabilization Facility - 234-5 Building (Project CGC-987)", dated October 15, 1962, by L. W. Finch.

HW-74914, Secret, "Purex Tank Farm Fill Program", dated October 16, 1962, by B. F. Judson and G. C. Oberg.

HW-74945, Secret AWD, "Project Proposal - Additional Plutonium Casting Facilities - 234-5 Building - RMA Line - (Project CGC-988)", dated October 15, 1962, by M. N. Raile.

HW-74964, Secret AWD, "Project Proposal, Electrical and Hydraulic Equipment Mezzanine - 234-5 Building, RMA Line (Project CGC-984)", dated September 20, 1962, by M. N. Raile.

HW-74965, Secret AWD, "Project Proposal - Plutonium Ingoting and Auxiliaries Facility - RMA Line - 234-5 Building (Project CGC-983)", dated September 20, 1962, by M. N. Raile.

HW-74997, Confidential, "Redox Test Program - FY-1963", dated September 21, 1962, by R. G. Barnes.

HW-75053, Secret, "Research and Development Incentives - Plutonium Processing", dated October 1, 1962, by H. H. Hopkins, Jr.

HW-75054, Secret, "Analysis of Brandy Nitrate Batch 62", dated September 25, 1962, by J. H. Warren.

HW-75070, Secret, "Progress Report - Weapons Process Engineering - September 1962", dated October 3, 1962, compiled by members of the Weapons Process Engineering Operation.

 [redacted]

HW-75100, Confidential, "Critical Mass Control Specification - Dissolving Plutonium Oxide in Room 161 of 234-5 Building", dated October 8, 1962, by R. J. Sloat.

HW-75134, OUO, "Hazards Evaluation - Project CGC-978, RMC Button Line Filtrate Handling Facility - Z Plant", dated October 4, 1962, by D. E. Braden, C. J. Berglund, S. G. Smolen, R. L. Stevenson.

HW-75154, Confidential, "Critical Mass Control Specification - Making Neutron Emissivity Checks on Buttons for Assessing Pu^{240} Content", dated October 12, 1962, by R. J. Sloat.

HW-75214 RD, Secret, "Purex Plant Production Schedule - October 1962", dated October 10, 1962, by D. McDonald.

HW-75215 RD, Secret, "Redox Plant Production Schedule - October 1962", dated October 10, 1962, by D. McDonald.

HW-75216 RD, Secret, "UO_3 Plant Production Schedule - October 1962", dated October 10, 1962, by D. McDonald.

HW-75217 RD, Secret, "234-5 Plant Production Schedule - October 1962", dated October 10, 1962, by D. McDonald.

HW-75222, Secret, "Critical Mass Control - Continuous Neptunium", dated May 9, 1962, by R. G. Barnes.

HW-75224, Unclassified, "United Kingdom Fabrication Specifications Primary Separations Plant - B-205", dated October 10, 1962, compiled by L. L. Zahn.

HW-75251, Secret, "Security of UO_3 Shipments", dated October 11, 1962, by J. H. Warren.

HW-75261, Unclassified, "Hanford Report on U.S.-U.K. Chemical Processing Exchange - September 10-14 - Windscale and Risley", dated October 12, 1962, by B F. Judson, M. T. Walling, Jr., J. H. Warren and L. L. Zahn.

HW-75275, Unclassified, "Flowsheet and Equipment for Plutonium Recovery from Fabrication Oil", dated October 19, 1962, by W. F. Unzicker.

HW-75293, Unclassified, "Critical Mass Control Specification - Ion Exchange", dated October 22, 1962, by R. J. Sloat.

HW-75336, Unclassified, "Evaluation of EPOXY Templates", dated October 22, 1962, by L. L. McGregor.

HW-75363, Confidential, "Continuous Electrowinning of Plutonium Metal - Status Report", dated October 26, 1962, by M. H. Curtis.

HW-75381, Secret, "Security of UO_3 Shipments", dated October 25, 1962, by J. H. Warren.

[redacted]

HW-75386, Unclassified, "Process Specifications and Operating Limits - Filtrate Ion Exchange Facility", dated October 30, 1962, by C. J. Berglund.

HW-75421, Secret, "Critical Mass Calculations for Low Density Metal Arrays", dated October 29, 1962, by R. L. Stevenson.

B. PREPARED FOR SIGNATURE AND ISSUANCE

HW-75101, Secret, "Production - September 1962", dated October 1, 1962, by W. E. Johnson.

HW-75289, Secret AWD, "HAPO Production Forecast - October 1, 1962 through June 30, 1964", dated October 25, 1962, by W. E. Johnson.

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

OCTOBER, 1962

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. Seimken

General Manager
Chemical Processing Department

END

DATE
FILMED
4/9/93