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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT
FOR

NOVEMBER, 1965

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Compiled By
OPERATION MANAGERS

December 22, 1965

HANFORD ATOMIC PRODUCTS OPERATION
RICHLAND, WASHINGTON

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STAFF

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Acting Manager, Production	M. K. Harmon
Manager, Purex	W. M. Harty
Manager, Redox	R. W. McCullugh
Manager, Weapons Manufacturing	S. G. Smolen
Manager, Finance	R. A. Connell
Manager, Research and Engineering	R. E. Tomlinson
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MONTHLY REPORT

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NOVEMBER, 1965

I. SUMMARY

November production, as per cent of the HAPO Production Forecast (RL-GEN-30), is summarized below:

	<u>November</u>	<u>Fiscal Year To Date</u>
Separated plutonium nitrate	81	98
Separated uranium nitrate	84	97
Uranium oxide	68	95
Plutonium metal buttons	184	111
Fabricated parts	99	99

The production of separated plutonium nitrate, separated uranium nitrate, and uranium oxide fell short of that forecasted, primarily because the scheduled Purex outage was extended about one week beyond the date originally planned. Uranium oxide production was also affected early in the month by a scheduled shutdown of Redox, which curtailed the E-metal feed supply for the calciners, and later by a week's outage to repair the acid cooler.

Purex operated satisfactorily until November 7 when it was shut down for a planned outage to repair the ammonia scrubber water and steam condensate lines, to install a new plutonium transfer-recycle tank, and to inspect and repair the cartridge from the solvent extraction column which is used in neptunium recovery. Processing was resumed on November 25 with feed consisting of nondefense material, from which the plutonium product has been designated for SEFOR (Southwest Experimental Fast Oxide Reactor).

In Purex Head-End, approximately 630 kilocuries of promethium-147 and 210 kilocuries of strontium-90 were produced.

The HAPO-IB-2 cask, loaded with 420,000 curies of cerium-144, was released for shipment on November 29.

Special testing and the development of operating procedures were continued for the new A-3 annular dissolver at Purex. In the information obtained to date, these tests have indicated that three such dissolvers will sustain Purex operation at a rate of 33.3 tons of uranium per day.

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Redox processing of E-metal was suspended for twelve days to permit design, fabrication and installation of a replacement cooling system for the feed tank for the solvent extraction partition cycle. The outage was caused by failure of the existing cooling coil on the feed tank. Operations were resumed on November 15, and performance was satisfactory for the remainder of the month.

After operating for only three weeks, the In-Tank Solidification unit was shut down because of excessive pressure drop across the replacement filter. Extensive deterioration was observed in the filter medium. Modifications to the unit, which were in progress at the end of November, will be completed before tests are resumed.

In Plutonium Reclamation, the normal plutonium recovery processing flowsheet rejects most of the uranium with an aqueous waste stream. During the recovery of plutonium from this waste, in turn, the uranium accumulates and recycles continuously, thus jeopardizing plutonium purity. A flowsheet modification was developed so that the approximately 150 grams per month of uranium accompanying the plutonium can be concentrated and removed periodically.

AEC Directive EQT-029, dated November 3, authorized \$25,000 for Project Proposal CGC-180, "Plutonium Buy-Back Facilities - 23405 Building".

General Manager

Chemical Processing Department

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

NOVEMBER 1965

II. ACHIEVEMENTS

A. PRODUCTION OPERATION

1. Production Statistics

a. <u>Percent of Forecast (1) Achieved</u>	<u>November</u>	<u>Fiscal Year to Date</u>
Separated plutonium nitrate	81	98
Separated uranium nitrate	84	97
Uranium oxide	68	95
Plutonium metal buttons	184	111
Fabricated parts	99	99

b. <u>Purex</u>	<u>November</u>	<u>October</u>
Uranium nitrate produced (tons)	211	389
Average production rate during operation (T/D)	20	22
Total waste loss (%)		
Plutonium	0.53	0.46
Uranium	0.30	0.22
On-line efficiency (%)	44	86

c. <u>Redox</u>		
Uranium nitrate produced (tons)	152	81
Average production rate during operation (T/D)	9	6
Total waste loss (%)		
Plutonium	0.52	0.75
Uranium	0.26	0.25
On-line efficiency (%)	58	41

d. <u>Uranium Reduction (tons)</u>		
Normal UO ₃ loaded	183	437
Enriched UO ₃ loaded	126	20
Normal UO ₃ approved for storage	183	457
Enriched UO ₃ approved for shipment	101	51
Normal UO ₃ shipped	0	0
Enriched UO ₃ shipped	101	142
Normal UNH backlog	170	142
Enriched UNH backlog	125	98

(1) RL-GEN-30, HAPO PRODUCTION FORECAST

e. Plutonium Metal Processing

	<u>November</u>	<u>October</u>
Reduction yield (%)	98	97
Product recovery output (kg)	82	84
Product recovery backlog (kg)	1 054	1 021
Waste disposal (grams)	306	1 776

f. Power

	<u>200-East</u>	<u>200-West</u>
Raw water pumped (gpm)	7 381	5 265
Filtered water pumped (gpm)	883	1 027
Maximum steam generated (lbs/hr)	210 000	140 000
Average steam generated (lbs/hr)	125 345	99 625
Total steam generated (M lbs)	90 250	71 729
Coal consumed (tons)	4 592	3 531

The production of separated plutonium nitrate, separated uranium nitrate, and uranium oxide fell short of that forecasted, primarily because the scheduled Purex outage was extended about one week beyond the date originally planned. Uranium oxide production was also affected early in the month by a scheduled shutdown of Redox, which curtailed the E-metal feed supply for the calciners, and later by a week's outage to repair the acid cooler.

MK Harrison
Acting Manager, Production

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2. FISSION PRODUCT DATA (Kilocuries)

[illegible]

(A) Reworking, previously purified.

(B) Shipped to Quehanna in HAPO-II-2 on 11-8-65.

(c) Shipped to ORL in HAP0-I-B-2 on 11-29-65.

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CHEMICAL PROCESSING DEPARTMENT
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NOVEMBER, 1965II. ACHIEVEMENTS (Continued)B. PUREX OPERATION1. Operating Continuity

Purex Plant operation continued until November 7, 1965 when a planned outage for maintenance and new equipment installation was initiated. Plant operation resumed on November 25, 1965 and continued the remainder of the month.

Operation of the fission product processing facilities at the Purex Head End and the Strontium Semiworks was satisfactory. There was essentially no processing activity at B Plant and none at the Cesium Loadout Facility. The cerium cask was loaded and shipped to the Oak Ridge Laboratory. One strontium cask was loaded.

2. Processing Operationsa. Purex Processing

Plutonium product met specifications but uranium batches, immediately after the startup on November 25, 1965, exceeded gamma specifications.

One neptunium purification run was completed, yielding 917 grams. Two shipments, totaling 1754 grams, were made.

Purex Plant operation continued at a capacity factor rate of 2.8 until a planned outage was initiated on November 7, 1965. Activities during the outage included the repair of the ammonia scrubber water and steam condensate lines exiting Trap Pit One, installation of a new plutonium vacuum transfer-recycle tank and the inspection and repair of the cartridge from a neptunium recovery solvent extraction column. Operation resumed on November 25, 1965 on non-weapons grade feed material to produce plutonium for the SEFOR (Southwest Experimental Fast Oxide Reactor) project, and continued the remainder of the month at a capacity factor of 2.4.

Special testing and development of operating procedures for the new A3 annular dissolver continued.

b. Purex Head End Processing

All of the available Purex high-level waste (LWW) was processed through the fission product recovery equipment. An estimated 630 kilocuries of promethium-147 and 210 kilocuries of strontium-90 were recovered.

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c. B Plant Processing

Volume reduction of the rare earth crude solution in Tank 6-2 was completed to enable combination with similar material in Tank 6-1.

d. Strontium Semiworks Processing

The promethium flowsheet test runs at the Strontium Semiworks were completed. The tests demonstrated reliable rare earth processing capability and distinct advantages of continuous solvent extraction processing over batch processing. During denitration and loadout of the rare earth fraction, precipitation of the rare earths occurred due to an excess of sugar addition (for denitration) and an insufficient digestion period to completely destroy all residual organic acids. Reprocessing of the product through solvent extraction and denitration was done without difficulty.

The HAPO-IB-2 cask was loaded with 420,000 curies of cerium-144 produced during the promethium flowsheet testing. Cerium in thirteen batches of feed solution was successively precipitated with sodium bisulfate and slurried to the cask as the sodium-cerium double salt.

At the end of the month the HAPO-IB-1 cask was loaded with strontium-90 and is undergoing calorimetric tests to determine the amount loaded.

e. Cesium Processing

There was no processing activity at the Cesium Loadout Facility.

f. Waste Management

The filter media of the replacement filter in the off-gas system of the In-Tank Waste Solidification Unit was sampled and found to be severely deteriorated at the bottom vapor entrance and to a lesser extent throughout. The filter had operated a period of only three weeks. A bypass around the filter was installed to determine the feasibility of operation with a portion of the off-gas not filtered. The test was terminated after eight hours when samples of the off-gas stream indicated inadequate off-gas decontamination across the system. The radioactivity of the condensate, although well below permissible limits, was significantly higher than past operation with the entire gas stream being filtered. A CWS filter system is being installed on the off-gas stack (exhauster discharge) prior to further test runs.

The supernatant liquid in Tank 103-C (approximately 400,000 gallons of contaminated cesium feed solution) was pumped to Tank 103-A after installing new transfer pumps in Tank 103-C and Tank 101-A.

180,000 gallons of non-boiling waste from Tank 101-AX were evaporated in Tank 103-AX.

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3. Equipment Experience

The Purex B Cell dissolver equipment was removed and the cell was prepared for installation of the second multipurpose annular dissolver.

The silver reactor (for radio-iodine removal) in the Purex C dissolver off-gas system was regenerated.

A leak was detected in one of the three pipe lines leading from the Purex Plant to A36 crib as a result of high radiation levels in Trap Pit One. An excavation was made just outside of the trap pit to permit repair of the leaking line and to inspect all other outlet pipe lines from the pit. An examination of the failed pipe, following its removal, revealed a one-half inch by one and one-half inch hole in the bottom of the pipe. The hole is believed to have been caused by removal of an angle iron support bracket during the trap pit repair work performed in February, 1965. In addition, the failed pipe appeared to have been affected by stress corrosion in that section of the pipe which was in the concrete wall of the pit. As a result of the one failed pipe line and the apparent poor condition of other lines within the concrete wall of the pit, the majority of the original pipe lines at Trap Pit One were replaced from a point within the pit to both the steam condensate header or the A36 crib line header.

Installation of the new Purex 3WF (backcycle waste concentrator feed stream) variable transfer jet, together with a magnetic flowmeter was completed during the November, 1965 shutdown. The 3WF pump was kept in place for a spare feed system.

The Purex recovered nitric acid rectifier condenser, E-F5, was replaced with a new unit designed for greater capacity and less pressure drop than the old unit. This replacement has improved operating vacuum on the condenser vent sugar denitration system and has increased the capacity of the high-level waste concentrator (E-F6).

A new L11 tank (plutonium vacuum transfer and recycle tank) was installed in the PR (plutonium product removal) Room at the Purex Plant.

Six faulty process solution transfer jumpers were replaced in the Purex Plant canyon.

Leaks have developed in the pulsers on the 2E (final uranium strip) column and the HA (co-decontamination) column at the Purex Plant. The leaks will require pulser replacements at both locations.

Inspection of the Purex 3B (neptunium strip) column cartridge revealed several of the plastic coated stainless steel sieve plates had become damaged. The cartridge was removed from the column and the damaged sieve plates were replaced. The cartridge was reinstalled and the column returned to service.

The electric lifting hoist in the Purex PR Room, used for handling product cans, was upgraded with a new electric-driven link-chain-type hoist. Preventive maintenance program inspection revealed the integrity of the removed hoist had become questionable (through long service) making the replacement necessary.

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A fresh nitric acid transfer pump (Pl2-2) at the Purex Plant failed when the mechanical shaft seal became damaged permitting acid to corrode other parts of the pump. Repairs were made by replacing bearings, impeller shaft and mechanical seal. The pump was returned to service and is operating satisfactorily.

A major overhaul was completed on the E2-A (fission product recovery) centrifuge high-pressure spray pump at the Purex Plant. This work consisted of replacing pistons and valves and installing a complete reconditioned crank shaft gear case.

Eight Purex Plant 440-volt electrical feeder breakers were removed from service and completely reconditioned and then reinstalled in the west switchgear room. This work was a preventive maintenance program item.

Field work to as-built electrical prints for Q Cell (neptunium ion exchange purification unit) and the neptunium recovery unit in the Purex Plant has been completed. This work was accomplished by Purex Maintenance personnel and Vitro Engineering. New as-built prints will be issued in the near future by Vitro Engineering.

The Purex railroad car puller electrical control circuit contact shoes, which permit the car puller to be operated remotely from the Purex east canyon crane, were replaced. This preventive maintenance program work will improve the performance and dependability of the car puller.

The HA and HC solvent extraction columns at the Semiworks are being decontaminated in preparation for replacement of the failed HAW (HA column waste) flow control valve.

A failed transfer pump from underground waste storage Tank 101-A was buried. The replacement pump also failed after pumping about 35,000 gallons of supernatant liquid from Tank 101-A to Tank 103-C.

4. Radiation Experience

Iodine 131 emission was 2.88 curies for the month.

A Purex process operator received a cut finger while sampling a plutonium solution. Wound smears and whole-body count were negative.

Continued monitoring of the Tank 105-A bulge detectors indicates no tank bottom movement. The radiation levels in the laterals beneath the tank have not changed.

Radiation detection well 136 in the BX tank farm has shown no significant increase in activity level since the initial rise in September, 1965.

5. Analytical Experience

Calibration curves and operating parameters have been established for the Wide Beta spectrometer. Information was obtained for both the automatic and manual counting systems. Operating procedures are being written for routine use of the instrument.

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The atomic absorption equipment which will be used to measure inert impurities in fission product solutions was delivered this month. The equipment will be assembled and modified for installation and remote operation in the shielded high level facility.

The XRD-6 X-ray fluorescence spectrometer has been calibrated for the analysis of nickel, chromium, and iron impurities in uranium product solution. This was done to accommodate the tighter specifications on enriched uranium product solution.

OV Smiset

Acting For
 Manager-Purex

OV Smiset:MLM:gt

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

NOVEMBER 1965

II. ACHIEVEMENTS (Continued)

C. REDOX OPERATION

1. Operating Continuity

E-metal processing in the Redox plant was interrupted for twelve days during the first part of the month because of a cooling coil leak in the feed tank for the solvent extraction partitioning cycle. Due to an earlier decision to reduce the spare equipment inventory in preparation for Redox shutdown, a spare unit was not available. It was necessary to design and fabricate an external cooler which could be installed adjacent to the tank. Operations were resumed on November 15, and plant performance from start-up through month-end was very satisfactory.

Production in the Uranium Oxide plant was curtailed early in the month by lack of feed and later in the month all calciners were idled for approximately eight days due to failure of the acid cooler.

2. Processing Operations

A. Redox Processing

Processing was interrupted on November 2 due to failure of the F-8 pump to the LS extraction column. During pump replacement a leak was detected in the cooling coil of the F-1 vessel (feed tank for the solvent extraction partition cycle). This failure created a difficult problem, in that a spare F-1 vessel was not available. An external cooler was subsequently designed, fabricated, and mounted above the F-1 vessel and a second pump was installed to circulate the tank contents through the cooler. Virgin feed processing was resumed on 11-15-65, and the plant performed well at an average rate of 87 percent at 97 percent efficiency for the balance of the month. Waste losses were better than average and all products met shipping specifications.

During the above shutdown, three test batches of Zircaloy-clad NPR 1.25 percent enriched uranium fuel elements were charged to the B-2 dissolver and successfully dissolved. Special samples were taken and analyzed for product conversion data.

The Redox Processing Operation accepted responsibility for the 242-T Waste Evaporator from the Facilities Engineering Operation during the last week of the month. At month-end operability tests

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were in progress and startup is expected to take place early in December.

B. Uranium Oxide Processing

Uranium Oxide production was below expectations due to lack of feed from the primary plants during the early part of the month; and later in the month a cooling water leak within the condenser which services all the off-gas streams from the calciners. A complete UO₃ Plant outage, lasting from November 15 to November 24, was required to effect repairs.

3. Mechanical Experience

A. Redox Plant

During the plant outage between November 2 and November 15, other major canyon equipment repairs were replacement of a leaking tube bundle in the H-4 feed oxidizer and removal of a failed tube bundle from the F-2 partitioning cycle feed concentrator. A replacement unit was not installed in the interest of advancing plant startup and with the knowledge that the remaining tube bundle in F-2 would provide sufficient capacity.

Repairs to the A-dissolver off-gas system, which resulted from an exothermic reaction in the system on 10-30-65, were completed and the dissolver was returned to service on 11-10-65. Although it had been determined that only the electric heater elements were damaged, the silver reactor and filter unit were replaced as a precautionary measure.

The right hand auxiliary hoist on the 60 ton canyon crane was replaced when it was found that the gear reducer housing for the travel was broken in three places. The new hoist was equipped with quick disconnect mountings and electrical connections on all motors, reelites and other equipment subject to failure. These changes should facilitate future maintenance on this equipment.

B. Uranium Oxide Plant

The A-4 calciner off-gas condenser was dismantled for inspection when excessive dilution of the by-product acid stream was detected. Subsequent investigation revealed a failed gasket on the floating head of the condenser. The head gasket was replaced and operation to date has been satisfactory. The job was complicated due to the fact that no in-place equipment existed to aid in the removal of the unit.

4. Waste Handling and Decontamination

Equipment valued at approximately \$57,000 was received from customers for decontamination, repair, inspection or burial during the month. Equipment valued at approximately \$56,000 was returned to customers, representing a savings of approximately \$38,000, based on the cost of new equipment.

The waste volume discharged to the TY-27 and Z-7 cribs this month from Battelle-Northwest was approximately 380,000 gallons (76 tank-truck loads). Modifications to the Z-7 crib were completed and effective 11-17-65, Battelle-Northwest tankers were routed to this location for waste disposal.

The transfer of Shippingport fuel elements to Battelle-Northwest, for testing purposes, was started this month. To date, four fuel elements have been removed from under-water storage at U-Plant and shipped to the 300 area via special cask.

5. Radiation Experience

There were no significant changes in the radiation readings under the 107, 108 and 109-SX underground waste storage tanks during the month and no measurable loss of material by liquid measurement has been detected. Isolation of the 108-SX tank by installation of its own condenser was completed on 11-2-65. Material balance calculations made so far, although not conclusive, tend to confirm that no active leaks exist in 108-SX.

6. Analytical Experience

The Redox Analytical Laboratory provided the Redox Plant with special analytical service for the dissolution of three charges of NPR Co-Product Fuels, which included fluoride and iron determinations on dissolver solutions. Product losses to canister and Zircaloy waste were approximately 2 percent uranium and 3.5 percent plutonium. Maximum corrosion to the dissolver coil, during uranium dissolution was calculated to be less than 10 mils per month.

R. W. McCallugh

Manager - Redox

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CHEMICAL PROCESSING DEPARTMENT
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NOVEMBER, 1965

II. ACHIEVEMENTS (Continued)

D. WEAPONS MANUFACTURING OPERATION

1. Operating Continuity

The fabrication of Model 10⁴-C weapon components was without significant interruption. The production of unfabricated plutonium was again limited by the supply of feed. Recovery processing was curtailed somewhat by the necessity to reprocess a portion of the output because of high uranium content and by the outage of the incinerator, which is being rebuilt. The waste-treatment facility and the americium-recovery equipment performed satisfactorily.

2. Processing Operations

a. Plutonium Fabrication

Information on plutonium-fabrication activities is presented in Document RL-SEP-890 (Atomic Weapon Data).

- b. The button line operated on a reduced schedule and processed high-Pu²⁴⁰ material as other blendable feed was available. The schedule provided opportunity to reduce the hood holdup and to perform needed repair work.

The following shipments of unclassified materials were made:

191 grams of Pu Nitrate to GE-Vallecitos
10 grams of Pu Nitrate to New Brunswick Lab
1970 grams of Pu Nitrate to Euratom - Mol, Belgium
574 grams of U²³³ Oxide to General Atomics - San Diego

c. Plutonium Reclamation

Eighty-two (82) kilograms of plutonium, as nitrate, were delivered to the button line from the recovery facilities during the month. An additional twenty-four (24) kilograms were produced but were high in uranium content and will require reprocessing.

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The incinerator furnace remained out of service, but sorting, leaching and repackaging were continued. Twenty-six (26) boxes of waste were processed through the facility.

Eight hundred and thirty-six (836) cans, containing approximately twenty (20) kilograms of plutonium were processed through the slag and crucible dissolvers during the month. This performance constituted a new record and resulted in a further reduction of the slag and crucible backlog.

Ninety-five (95) grams of plutonium were returned to the main process stream from 90,366 liters of aqueous waste, which were processed through the waste-treatment facility. Also, 9.8 grams of americium were recovered and stored for further processing.

Removal of the plutonium from the Recuplex facility continued, with 710 grams being recovered during the month. Cleanout of the RB hood and vessels was completed and work was started in SE hood.

3. Mechanical Performance

Equipment used for regular fabrication and inspection work operated satisfactorily. The lathes used for the fabrication of the Robin X experimental parts required extensive conditioning of the electrical, electronic, hydraulic and mechanical systems before the desired accuracy was achieved.

Button line equipment performed satisfactorily except for some minor delays resulting from fluorinator vacuum problems.

Recovery equipment, including the slag and crucible dissolvers, performed satisfactorily during the month. Dissolver lost time was due to the failure of the condenser on the Mark II (04) vessel, and to plugging of the lines to the Mark I (06) vessel.

Twenty-two pump failures were experienced in the recovery facility during the month. Nineteen pumps were repaired and returned to service. Three (all Chempumps) were beyond repair and were buried.

Laboratory equipment performed satisfactorily except for the SU-13 mass spectrometer, where relays caused difficult-to-trace electrical problems.

During the month the supplier of Incoloy 800 announced an eight-week delay in the delivery of the plate and pipe required for the rebuilding of the incinerator furnace. This will result in a delay in the scheduled start-up of this unit until May 1966.

4. Radiation Experience

Radiation and contamination control statistics indicated good control during the month.

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One case of potential plutonium deposition was experienced when an operator incurred a contaminated injury while working in a process hood in the incinerator building. The wound was successfully excised and no deposition is anticipated.

5. Analytical Experience

Number of samples received	3,782
Number of determinations	25,916

The additional work load during the month resulted from uranium problems in the recovery process and from the SEFOR program activity at Purex.

Manager
Weapons Manufacturing

SG Smolen:ap

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

November, 1965

II. ACHIEVEMENTS (Continued)

E. FINANCE AND SERVICES OPERATION

1. Production Cost Accounting

Work on the FY 1966 Midyear Budget Review is proceeding. Firm assumptions on the Isochem Inc. organization have been established and section managers are reviewing their FY 66 budget requirements.

Interim estimates have been calculated as to the effect of the fabrication shutdown on funds required in the O2 Program for FY 1966. In general, it was estimated that some \$22.6 million would be required in the O2 Production Program for FY 1966 versus the \$22 million estimated prior to advice on shutdown.

2. General Accounting

As of November 30, 1965, there was fourteen active projects. Following is a summary of current status of projects:

In Thousands

Total Authorized Funds and Transferred Capital	
Property Authorizations	\$3,820
Total Cost to Date	2,434
Commitments & Open Work Releases	306
Unencumbered Balance	1,080
Costs Charged During November, 1965	118

During November, three work authorities and one directive were received from the AEC: Directive No. HW-548, Work Authority No. 4, Project CAC-981, Fission Product Packaging Facility - B Plant, authorizing transfer of capital property, amount \$207,000; Directive No. AEC-244, Work Authority No. 3, Project CAC-144, Waste Fractionization - B Plant, for increase of funds to new total of \$155,000, and authorizing transfer of capital property, amount \$185,000; Directive No. AEC-254, Work Authority No. 3, Project CAC-169, Sludge Removal and Waste Transfer - 200 East Area, for increase in funds to new total of \$160,000; Directive No. EQT-029, Project CGC-180, Plutonium Buy-Back Facility - 234-5 Building, interim authorization of \$25,000.

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There were no Construction Completion and Cost Closing statements issued during November.

During the month of November, five Appropriation Requests totaling \$48,450 were authorized. The approved AR's are detailed as follows:

<u>AR No.</u>	<u>Description</u>	<u>Amount</u>
66012	Storage Drums Pu Buy-Back Facility	\$34,000
66014	Two Pen Recorder for Packaging Cell	1,500
66015	Miniature Closed Circuit TV	5,500
66016	Portable Liquid and Sludge Detector	5,500
66017	Lectrofilter Replacement	<u>1,950</u>
	Total	<u>\$48,450</u>

3. Purchasing

Purchase Orders and Contracts placed during November, 1965, include:

<u>Type</u>	<u>No.</u>	<u>Value</u>
Formal Orders	234	\$247,792
Verbal Orders	104	4,521
Essential Materials Orders	<u>7</u>	<u>21,349</u>
Total	<u>345</u>	<u>\$273,662</u>

Included in the months purchasing activity was one significant order for skirt assemblies. The order was placed with K-F Products Co. of Denver, Colorado, at a total cost of \$27,662.50.

4. Business Information Systems

The Isochem Inc. mechanized payroll system has been approximately 90% completed. At this time the basic system is in place with the exception of certain employee benefit plan details.

As a result of the Weapons Production cutback, a keypunch and verifier will be transferred to Business Information Systems in December. As a result of this transfer, outstanding orders for new equipment of this type have been cancelled.

W. J. Smith
for Manager - Finance

[REDACTED]

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

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NOVEMBER, 1965II. ACHIEVEMENTS (continued)F. FACILITIES ENGINEERING OPERATION1. Purex"N" Cell

New design is being prepared for the titanium concentrator and cooler in "N" Cell. These will be built next month for use as interim spare equipment for the installed tantalum-lined components. The long-range program calls for updating present drawings of tantalum-lined components so that purchase may be initiated.

High Purity Water

The Purex high purity water still has been installed and is now operating. A difficulty with high condensate product temperature was overcome by re-piping the feed preheater to provide condensate subcooling.

4.0 Capacity Factor Expansion

Part I of the design criteria document (RL-SEP-624), was completed and approved by project representatives. The design criteria are being defined for the items which are to be included in Part II of the project. The feasibility study on four gamma monitors has been completed, and design criteria are being written. A preliminary project proposal requesting design and procurement funds is circulating for approvals.

241-BY Farm Stack Instrumentation

The system designed to detect gross beta-gamma being emitted from the in-tank solidification stack at 241-BY Tank Farm, was installed and is operating very satisfactorily.

Remote Gasketing

A study concluded that most remote teflon gasketing provides an insufficient seal on large flanges. This results in a need for increasingly larger vent discharge capacities. The situation can be improved by reducing the seal area of these gaskets, or by increasing the gasket thickness, since a thicker gasket will seal with less pressure. The latter approach is being taken for new Purex gaskets with 1/4-inch thickness being substituted for present 3/32-inch thickness.

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CAC-169-Rev. #1-Sludge Removal & Waste Transfer-200-E Area

Preparation of the proposal revision requesting authorization of total project funds was carried out concurrently with the Title I design work during the month. The proposal revision was transmitted to RLOO on November 18.

2. Redox

F-1 Cooler

A temporary cooling system was designed on an expedited schedule and installed when the Redox F-1 Cooler failed and no replacement was available. A spare condenser was installed in the cell to provide 2DF stream cooling. The plant has been placed back in operation and the new equipment is performing satisfactorily. A new F-1 Tank is being designed for early on-site fabrication.

Long-term UO₃ Storage

A study of ways to store uranium oxide for at least ten years has been completed. Consideration was given to bulk storage, drum storage in buildings, and drum storage outdoors. It was recommended that outside storage be continued, but that the drums should have a better protective coating and the pallets should be treated with a preservative. It was also recommended that the drums in the existing stock pile be kept under surveillance and any corrective action delayed until more is known about corrosion rates and protective coatings.

NPR Fuel Handling Yoke

A yoke was designed for handling the NRD fuel bucket, during transloading of NRD in "U" Plant, for shipping to Nuclear Fuels Services.

Fire Alarm Addition

Design has been completed on an auxiliary fire detection head installation for the SWP lobby and associated areas at 202-S Building.

3. Weapons Manufacturing

Button Lines

The installation of the new Plutonium Receiving Glove Box (HC-4) in Room #166 of the 234-5 Building was completed. Instrument and vessel calibration work is in progress.

Plutonium Reclamation

Detail design was completed on bank tank entry and outlet modifications and a re-circulation-agitation system for improved distribution and mixing characteristics in the process cell vessels.

An engineering flow diagram has been completed for uranium decontamination, utilizing the existing CR organic wash column. Fresh organic extractant is now batch-washed in the cold chemical preparation room, thus installation of the uranium decontamination equipment is not now required.

An engineering study to devise a method for replacing the O6 slag and crucible dissolver electric ball valve operators with pneumatic operators has been completed. The magnitude of the preliminary cost estimates resulted in the decision not to carry out the proposed changes.

Low-level Waste Disposal

A study has been initiated to devise a system that will reduce the bulk volume of low-level wastes now sealed in cartons and buried. To date, design work is being performed on a small, prototype punch and die set which will be used to indicate how much the materials "spring back" when they are compressed. Such information will greatly facilitate preliminary design work on a pressing-baling system. Incineration has been ruled out because of the high cost of maintaining such a facility. Systems of volume reduction other than pressing are also being investigated.

Triple ASP Unit - 234-5 Laboratory

All the alpha Simpson proportional amplifiers in the laboratory have been modified and given final adjustments. The units are now giving excellent service. A minor problem of indicator light failures is under investigation.

In-tank Solidification

A stack filter was designed and built to filter the off-gas from the condenser vent on the in-tank solidification system.

CGC-180 - Plutonium Buy-back Facility-234-5 Building

A project proposal requesting provision of facilities to receive, prepare for storage and re-package NFS plutonium was transmitted to RL00 on October 4. Directive No. EQT-029, dated November 3, authorized \$25,000.

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4. General

Adhesion - Exit Technique

A film narrative (RL-SA-57) in three parts has been completed, together with the accompanying reels of color movies of the adhesive exit technique. The filmed presentation was made at the November 29 meeting of the CPD Task Force on Protective Clothing and Breathing Air. The film is now available for in-plant presentation. One set of the plastic clothing and associated cooling and breathing air equipment has been made available for leakage tests by the Occupational Hygiene Section of the Hanford Occupational Health Foundation.

FPCE Integration

The design criteria document which covers the Hot Pipe Trench and Cell Modifications for Cells 36 through 40, was approved by the Atomic Energy Commission on November 4.

The design criteria document for the FPCE integration equipment was essentially completed. The actual completion must await decision on the alternates of Column 1C Batch or continuous column operation.

Shops Fabrication

Thirty-three jumpers were fabricated during the month, of which nine were done on an emergency basis. Four parts were completed for the Floturn lathe in Weapons Fabrication. The spare F-6 Condenser was modified, tested, and shipped to Redox for installation.

Export Water Systems

Tests were conducted on the export water system to determine the system pressure transients resulting from loss of electric-powered pumping in the modified export system. New pressure settings were established and tests made which showed the system would perform as desired.

Raw Water Basin Cleaning

The 282-East Area Raw Water Storage Basin was cleaned during two shifts on November 16 and 17. The layer of silt and debris which accumulated in about ten years was six to eight inches deep on the bottom and sloped sides of the basin. Removal was accomplished in twelve hours without incident.

HP Shaw/WWC/alr

Manager - Facilities Engineering

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (Continued)

G. RESEARCH AND ENGINEERING OPERATION

1. Separations Process Engineering

Purex

a. Annular Dissolver

Modifications to the dissolver operating procedure has resulted in the attainment of an average operating rate equivalent to at least 4.0 CF, over a four-day test period. The duration of the test period was limited by the shutdown of the Purex solvent-extraction system.

The fission product activity in the spent scrub water from the new ammonia scrubber is currently 100 to 500-fold higher than from the original Purex pot-type dissolver system (typically about 100 $\mu\text{C/gallon}$). As compared with the experience reported for October, this represents a 10 to 50-fold improvement that has been attained by modifications of the operating procedures. Principally, the modifications provide for water-flushing the downdraft condenser and ammonia scrubber operations.

To reduce dissolver entrainment and to further reduce the activity in the spent scrub water, the second annular dissolver scheduled for installation will be modified at the dissolver off-gas outlet. The gas outlet will be from the dissolver charging chute and will be designed to provide an exit vapor velocity five-fold lower than the original design.

b. Neptunium Recovery

During the November shutdown period, the 3B Column cartridge was chemically flushed for fission-product removal and to improve the cartridge efficiency by assuring that the stainless steel portions of the cartridge would be aqueous wet. Following the flushing operation, the cartridge was removed for inspection. The inspection showed that several of the plastic-coated stainless steel plates in the lower section had failed by separation of the plastic and steel. The six plates in the poorest condition were replaced with available spare plates. Subsequent operation of the 3B Column has shown a significant improvement in the 3BW neptunium losses, and the system has apparently been restored to normal.

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c. Acid Recovery

Installation of a condenser of improved design for condensation of the Acid Absorber (T-F5) overheads has permitted an increase in the boil-off rate of the high-level waste concentrator (E-F6) of about 40 percent. The new condenser operates with a lower pressure drop than the original design. In addition, the condenser replacement apparently resulted in reduced air in-leakage to the vapor system. Together these changes increased the capacity of the condenser vent system and, therefore, the capacity of E-F6.

Redoxa. Exothermic Reaction - A-3 Heater and Silver Reactor

On October 30, 1965, during a routine aluminum-jacket dissolution step in the A-2 Dissolver, reaction off-gases were unintentionally routed through the off-gas heater and silver reactor as a result of a failure of the air-operated valving system. An exothermic reaction, apparently involving ammonia and/or hydrogen, was initiated and continued for about three hours. Temperatures in excess of 1,000 F were measured in the heater-reactor section of the off-gas train. The off-gas heater was damaged beyond repair. The dissolver was taken out of service until a replacement off-gas heater, silver reactor and filter were installed. Before the reactor and heater were removed from the cell, they were flushed internally with approximately 200 gallons of 2.0 M sodium thiosulfate - 0.1 M sodium hydroxide to dissolve any hazardous silver compounds which might have been present. The reactor and heater were then flushed with water and were replaced without incident. The dissolver was returned to service on November 10. The mechanism for the exothermic reaction has not yet been determined. The routing of off-gases from aluminum-jacket dissolutions through heater-reactor system was routine practice for many years, during which time exothermic reactions of this type were never noted.

b. Test Dissolutions - NPR Co-Producer Fuel

Three small charges (1173.6 pounds each) of Zircaloy-clad NPR 1.25 percent enriched uranium fuel elements were dissolved in the B-2 Dissolver during the period November 4 through November 16, 1965. The aluminum canisters were dissolved in a 4.1 M sodium nitrate - 1.0 M sodium hydroxide; the Zircaloy cladding was dissolved in 4.0 M NH_4F - 0.34 M NH_4NO_3 ; and the uranium was dissolved in 7.0 M HNO_3 - 1.06 M $\text{Al}(\text{NO}_3)_3 \cdot 9 \text{H}_2\text{O}$. Product losses to canister and Zircaloy waste were 2.0 percent uranium and 3.5 percent plutonium.

Prior to dissolution of the uranium in nitric acid, 2,326 pounds of 68.5 percent aluminum nitrate nonahydrate (ANN) was added to

complex the fluoride (from UF_4 and PuF_4) formed during the Zircaloy decladding dissolution. This was expected to provide a 3-to-1 mole ratio of ANN-to-fluoride, based on the expected amount of uranium fluoride. (Approximately 7 percent of the charged uranium was apparently converted to UF_4 during Zircaloy dissolution of 3 charges in July, 1965.) However, fluoride analyses of the dissolver samples indicated that less than 4 percent of the uranium charged was converted to UF_4 , and that the ANN-to-fluoride mol ratio actually attained was approximately 8 to 1. Maximum corrosion to the dissolver coil, during uranium dissolution, was calculated to be less than 10 mils per month.

The Zircaloy dissolution was successfully accomplished during a six-hour boiling digest. An eight-hour digest was used on the charges dissolved in July, 1965. The reduced digest time may account for the decreased conversion of uranium to uranium fluoride. Further Zircaloy dissolution experience or development of instrumentation to detect the end of Zircaloy dissolution may permit further reduction of the Zircaloy dissolution time cycle and reduced conversion of uranium to uranium fluoride.

2. Fission Products Process Engineering

a. In-Tank Solidification

The in-tank solidification unit was operated for only three weeks with a replacement filter before high pressure drop through the filter precluded further effective operation. As with the first unit, the Fiberglas packing in the lower portion of the filter was found to be badly deteriorated. A bypass consisting of an eight-inch pipe connecting the chambers above and below the filter bed was installed to permit continued experimental operation of the unit. An air-operated butterfly valve was included in the bypass to permit control of the filter pressure drop and an off-gas monitor with a recorder was installed in the exhauster discharge stack sampler. The unit was restarted on a test basis with an air flow rate of 12,000 pounds per hour at an air temperature of 800 F, later raised to 1000 F. To maintain a filter pressure drop of 28 inches of water the bypass valve was gradually opened as filter plugging increased until most of the air flow was through the bypass. As the air flow through the bypass increased the amount of activity, primarily cesium-137, discharged to the atmosphere increased. A maximum release rate of 0.5 curie per week was reached at the conclusion of the test equaling the release limit for cesium-137 from short stacks such as that on the ITS unit. Activity in the condensate, which was routed to the tank during the test, increased but was still a factor of five below the operational guide limit. To permit continued operation of the in-tank solidification unit while investigating the Fiberglas filter deterioration, a CWS filter is being installed in the exhauster discharge and the Fiberglas filter is being bypassed.

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The 240 KW Watlow prototype immersion heater partially failed after 480 hours of operation. Amperage readings of 50 were measured as compared to the normal value of 310. The heater unit was removed for decontamination and inspection. The 120 KW General Electric heater unit continued to operate satisfactorily. The Watlow unit is designed for a power density of 150 to 310 watts per square inch, while that of the General Electric unit is 20 watts per square inch.

b. Fission Product Recovery

Rare earth product solutions containing promethium from test runs conducted at the Strontium Semiworks were combined, concentrated and denitrated for loadout to Battelle-Northwest. The rare earths were precipitated during the denitration due to the use of excess sugar and incomplete digestion before transfer from the denitration vessel. Only about 15 percent of the rare earths were transferred to the shipping cask following completion of the digestion in another vessel. The rare-earth solids were contaminated with sodium salts and nitric and oxalic acids from a solvent wash process before cask samples indicated the loss had occurred. The rare earths were dissolved in the nitric acid from the solvent wash, and the oxalic acid destroyed by boiling the solution at about 6 M acid to assure the solubility of the rare earths. The solution was then reworked by D2EHPA solvent extraction to remove sodium. Tartaric acid was used as the chelating agent rather than HEDTA since there were no metal ions other than sodium to be removed. Use of the tartaric acid permitted greater than 95 percent recovery of the rare earths. The purified product was denitrated without incident and is ready for loadout.

A modified strontium loadout flowsheet was tested on plant scale in February, 1965, to separate decay daughter zirconium from strontium by the use of potassium carbonate rather than sodium hydroxide for the final neutralization. Zirconium analyses of the feed, product, and supernatant waste solution reported by Battelle-Northwest this month indicate that greater than 90 percent of the zirconium was removed from the strontium in the loadout test. Analyses of the feed and supernatant waste solution from a normal strontium loadout (after hydroxide precipitation) in October, 1965, indicated that no separation of strontium and zirconium was achieved confirming the results of laboratory studies of the two flowsheets.

Approximately 400 kilocuries of cerium-144 were loaded out as a cerium-sodium double sulfate into the HAPO-IB-2 cask for shipment to ORNL. The cerium nitrate-nitric acid product solution was adjusted to pH 0.5 to 0.7 with sodium hydroxide, and the cerium was precipitated by the addition of 5 M sodium bisulfate to a final concentration of 0.5 M sulfate. The

slurry was digested for one hour at 60 C and then passed through the warmed filter cask. Limited process equipment size necessitated the loadout of a number of small batches resulting in interrupted flow to the cask between batches. Analyses indicated that about 90 percent of the feed was loaded with about half of the 10 percent over-all waste loss occurring in the first batch. This loss pattern would indicate that waste losses were controlled by particle size rather than solubility.

3. Plutonium Process Engineering

a. Uranium in Plutonium Reclamation Facility Plutonium Product

It has been observed that uranium in trace quantities enters the Reclamation Facility as part of the oxalate solution waste stream received from the button line. Studies were initiated to determine how best to eliminate uranium and prevent it from returning to the button line in the plutonium product solution. Concentrations in excess of 2,000 parts uranium per million parts plutonium could result in undesirably high concentrations in the metal buttons. Review of factors affecting distribution ratios showed that the high concentrations of plutonium in the stripping column forced the uranium to a point lower in the column (the raffinate end) than had heretofore been realized. Further, the extraction efficiency was so great that all uranium input for several months (up to 1 KG) could be held in the organic phase before finally causing the product to exceed specification.

A test procedure was executed which enabled partial removal of the uranium. The concentration of hydroxylamine nitrate (HN) in the stripping solution (CCX) was increased from 0.06 M to 0.2 M. This increased the uranium content in the stripped organic (CCW), which was then discarded. Additional sodium nitrate was added to feed streams to compensate for the extra HN added. Fifty-five percent of the 310 grams uranium initially in the column was removed, and product purity returned to normal.

Even greater separation (>95%) has been demonstrated by continuous washing of the organic with 0.25 M HF - H₂O. It is now evident that the roughly 150 grams uranium per month introduced to the system can be successfully removed on a campaign basis.

b. Dissolver Materials of Construction

Many failures of the teflon-lined equipment prompted a search for more satisfactory materials of construction. Coupons of several newer alloys and better stainless steels were tested in a slag and crucible dissolver and a batch plutonium oxide dissolver, both of which see hot nitric-hydrofluoric acid service. Preliminary results indicate that HAP0 20, Corronel 230, and 310 stainless steel may prove satisfactory as materials of construction.

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for batch plutonium oxide dissolvers. These same metals, plus the 304-L and 309 Scb stainless steel, may also be satisfactory for use in slag and crucible dissolver service. HAPO 20 and 304-L can be fabricated in a normal manner. The other metals would require special fabrication technique so that the weld metal would not be exposed to the corrosive solution. The following table shows the results obtained from the corrosion coupons tested; the tests were intermittent, and the calculated corrosion rates are subject to significant, but undetermined, error.

APPROXIMATE CORROSION RATE
MILS/MONTH

<u>Material</u>	<u>Oxide Dissolver</u>	<u>S&C Dissolver</u>
HAPO 20	4	1.2
Corronel 230	1.9	0.6
304-L	15	4
310	6	1.3
316-L	18	Not Tested
316	18	Not Tested
309 Scb	Coupon Lost	4

The root pass of the Corronel 230 weld metal was moderately attacked intergranularly. Preferential weld metal attack of the 309 Scb and 310 weldments were severe. Preferential attack of the 304-L and HAPO 20 weldments was nil to very slight.

c. Ground Disposal of Liquid Waste

Studies of the disposal of acid wastes in the Z-1A tile field were continued in Battelle Northwest Laboratories, and the neutralization capacities of soil materials selected from well samples at the site were reported. Soil material from 5 to 135 feet and from 160 feet to ground water will neutralize an average of 0.43 meq acid per gram of soil. The caliche zone from 135 to 160 feet will neutralize 3.26 meq/gram. Data from experimental soil columns showed that about 1 column volume of waste could be infiltrated into soil material from 5 to 135 feet and below 160 feet before the neutralization capacity of the soil was depleted. Soil in the zone from 135 to 160 feet can neutralize as much waste as the rest of the profile; however, flow characteristics through this strata are very poor, and lateral spreading may occur.

4. Separations Chemistry Laboratory

a. Process Improvement

Improved Decontamination of Neptunium in Redox

A process which relies upon solvent extraction techniques rather than volatilization for the removal of ruthenium from the neptunium streams has been demonstrated in the laboratory. Ruthenium contamination is decreased by an arithmetic factor of 50 and the plutonium and chromium are also significantly reduced in the neptunium product.

The new technique first utilizes a reducing flowsheet in which Np(IV) is extracted into hexone and stripped back into an aqueous phase. The neptunium is then oxidized to Np(VI) by ceric ion under acid deficient conditions, again extracted into hexone, and then stripped as the purified neptunium. Both sodium nitrite and ferrous sulfamate are used in the initial reducing step. The nitrite is used to reduce any dichromate present; excess nitrite is destroyed by boiling. Ferrous sulfamate is then added to produce the desired Np(IV) state.

Stability of Ferrocyanide Waste Materials

The planned use of nickel ferrocyanide as a precipitating agent in B Plant processes has prompted laboratory investigations into the stability of the resulting waste solutions. Reactions between solid nitrate salts and ferrocyanides have been demonstrated but only at abnormally high concentrations of the constituents and at elevated temperatures. There appears no possibility of a reaction with the 0.005 M concentrations specified in the flowsheet. An efficient method of destroying cyanide complexes even at low concentrations is being sought.

b. Americium Purification

Application of a solvent extraction procedure for the removal of europium from the americium has now been demonstrated and is being utilized for the purification of the crude americium oxide on hand. The solvent is 1.5 M D2EHPA in toluene. Product recovery with this procedure has been about 80%, and spectrographic results indicate that approximately 99% purification may be realized. The extraction equipment is on a laboratory scale so that only about 6 grams can be processed at one time. Following extraction the material will be precipitated and calcined. The extraction work has been transferred to a new hood where most of the work can be performed behind a lead brick barrier. Work can now be performed at exposure rates of around 50 mr/day.

c. Analytical Development and Improvement

Spectrographic Methods

Some work continued toward finding an effective method for the spectrographic determination of rare earths. Four

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different carriers were tried - sodium fluoride and graphite, gallium oxide, silver chloride, and lithium chloride. Sodium fluoride shows the most promise provided the procedure utilizes an effective pre-extraction step to remove heavy metals.

Colorimetric Iron Determination

A comprehensive review was made of the colorimetric method for determining iron in plutonium metal (o-phenanthroline method). The equipment, time factor, and method were critically tested. A bias of about 25 ppm Fe was found to be contributed by the glassware, and procedures were changed to correct this condition.

Relationship of Metal Purity and Density

The statistical review of data on the density and purity of plutonium metal samples continued during the month with the following observations:

Ingots were statistically demonstrated to be more suitable than buttons for the determination of plutonium metal purity. Analysis of variance showed the samples from the ingots to have a significantly lower impurity measurement variability than the samples from the buttons. Multiple regression of individual impurity element concentration on density gave highly significant multiple correlation coefficients for ingots. In particular, the use of the density of a sample obtained during the pouring of the ingot and subsequently subjected to high pressure in the laboratory provided the best correlation between measured impurities and measured density.

Programmed Calculator for Gamma Scans

A Friden 6010 has been programmed by Friden for interpretation of gamma energy analytical data. The unit was tested in Oakland, using typical Hanford analytical data in its normal format. The system performed all functions required for the interpretation of spectra containing up to six components with minimum attendance and in less than five minutes. Its use at Purex and at Redox would permit routine 30 minute gamma analysis of any CPD originated sample.

Non-Coincidence Detector for Mn-54

The shield and counting chamber of a system for the analysis of Mn-54 in high beta-gamma interference fields was assembled. Samples will be mounted in a liquid scintillator (which detects beta), and these will be placed in close proximity to a NaI(Tl) gamma detector. Only those gamma signals not in coincidence with beta particles are counted and analyzed.

5. Plutonium Chemistry Laboratory

a. Americium Purification

A document was issued, "Americium Purification Alternatives: A Literature Study," RL-SEP-836 (Unclassified). Five purification flowsheets are described which are capable of providing americium purification from the transition, alkaline earth, and rare earth impurities found in the Americium Recovery Facility. These flowsheets are discussed with respect to compatibility criteria.

b. Recovery of Plutonium From Polystyrene Cubes

Since use of chloroform solvent on PuO₂-polystyrene cubes was ineffective, an alternate process was sought.

A combination distillation-burning process was proposed to remove the polystyrene. This procedure calls for heating the cubes at 375 C until all of the volatile material is burned or boiled off. The residue (mainly PuO₂) is then heated to ≥600 C for two to five hours (i.e., until all burning ceases). The powder is stirred during this step. Product from this procedure was analyzed at 80 to 89 wt. % Pu, 0.2 to 0.3% volatile material, and 60 to 200 ppm C.

Process safety is insured by removing off-gases through a trap, and using a glow-wire to insure that combustibles are ignited as they leave the furnace.

R. E. Tomlinson

Manager
Research and Engineering

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CHEMICAL PROCESSING DEPARTMENT
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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>10-31-65</u>	<u>11-28-65</u>	<u>10-31-65</u>	<u>11-28-65</u>	<u>10-31-65</u>	<u>11-28-65</u>
General Manager's Group	10	10	4	4	14	14
Finance & Services	38	40	48	51	86	91
Employee Relations	14	14	7	6	21	20
Research & Engineering	57	59	29	29	86	88
Facilities Engineering	95	96	200	202	295	298
Production	5	5	3	3	8	8
Redox	62	62	237	238	299	300
Purex	75	74	289	292	364	366
Weapons Manufacturing	<u>53</u>	<u>52</u>	<u>232</u>	<u>231</u>	<u>285</u>	<u>283</u>
Total	<u>409</u>	<u>412</u>	<u>1049</u>	<u>1056</u>	<u>1458</u>	<u>1468</u>

B. PERSONNEL AND ORGANIZATION CHANGES

Finance & Services Organization Changes

Subsection Title Changes -

General and Tax Accounting to General Accounting.
Business Programs to Special Studies and Reports.
Production Cost Accounting to Cost Accounting.

Subsection Added -

Corporate Accounting

Personnel Changes

R. W. Calhoun - Specialist, Property Management, appointed to Manager, General Accounting.

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W. G. Smith - Financial Analyst, Business Programs, appointed to Manager, Special Studies and Reports.

B. M. Dobbs - Manager, Production Cost Accounting, appointed to Manager, Cost Accounting.

M. J. Smith - Manager, General and Tax Accounting, appointed to Manager, Corporate Accounting.

Weapons Manufacturing Organization Changes

Subsection Changes -

Plutonium Reduction and Fabrication and Building Services combined and retitled - Plutonium Reduction and Fabrication - new title.

Personnel Changes

L. M. Knights - Manager, Quality Control appointed to Manager, Plutonium Process Engineering.

L. I. Brecke - Manager, Fabrication and Building Services, appointed to Manager, Plutonium Reduction and Fabrication.

J. W. Fillmore - Manager, Plutonium Reclamation, appointed to Manager, Quality Control.

R. E. Olson - Manager, Plutonium Reduction, appointed to Manager, Plutonium Reclamation.

Research and Engineering Organization Changes

Personnel Changes

R. J. Sloat - Manager, Plutonium Process Engineering, appointed to Manager, Technological and Environmental Safety.

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C. TRIPS

<u>Visitor</u>	<u>To</u>	<u>Nature of Discussion</u>
<u>To Other GE Components</u>		
A. J. Waligura	Crotonville, N.Y.	Engineering Workshop. (11/1-5/65)
	Schenectady, N.Y.	Research Lab tour. (11/8/65)
D. D. Wodrich	Erie, Pennsylvania	Remote controlled locomotives. (11/10/65)
<u>To AEC and Other AEC Contractors</u>		
J. H. Warren	US-AEC Germantown, Md.	Co-product production (11/4/65)
A. J. Waligura	Brookhaven National Lab. Upton, N.Y.	Laboratory tour. (11/9/65)
D. J. Brown	Mallinckrodt Chemical Co. St. Louis, Mo.	Radioactive waste disposal. (11/9/65)
O. F. Hill	Oak Ridge National Lab. Oak Ridge, Tenn.	Separations Technology. (11/10-12/65)
R. E. Tomlinson	US-AEC Germantown, Md.	Security. (11/16-19/65)
D. McDonald	AEC-DMA Albuquerque, N. Mex.	Production schedules. (11/16-17/65)
<u>To General Industry</u>		
D. D. Wodrich	Jeffrey Manufacturing Co. Columbus, Ohio	Remote controlled locomotives. (11/8/65)
	Atlas Car & Mfg. Co. Cleveland, Ohio	" (11/9/65)
	National Mine Services Co. Ashland, Kentucky	" (11/11/65)
	Westinghouse Air Brake Chicago, Ill.	" (11/12/65)

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C. TRIPS (Continued)

<u>Visitor</u>	<u>To</u>	<u>Nature of Discussion</u>
<u>To General Industry</u>		
W. H. Zimmer	Friden, Inc. Oakland, Calif.	Computer systems. (11/12/65)
<u>To Conventions and General Meetings</u>		
D. J. Brown	University of Ill. Urbana, Ill.	Hydrology symposium. (11/10-12/65)
J. H. Warren	Washington, D.C.	Atomic Industrial Forum. (11/11/65)
R. E. Felt	Washington, D. C.	ANS Paper. (11/14/65)
<u>To Foreign Governments and Agencies</u>		
G. R. Kiel	Stockholm, Sweden	Criticality control. (11/1-5/65)
	Dijon, France	" (11/8-9/65)
	Eurochemic Mol, Belgium	" (11/10-11/65)
	UKEA Aldermaston, England	" (11/15/65)
A. E. Smith	UKEA Aldermaston, England	IMOG-JOWOG (11/12-17/65)

D. VISITORS

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From Other GE Components</u>		
A. B. Carson	APD	Hazards evaluation.
D. H. Marquis	San Jose, Calif.	(11/9/65)
Paul Hill		
<u>From AEC and Other AEC Contractors</u>		
R. W. Schaich	Oak Ridge National Lab. Oak Ridge, Tenn.	Cesium shipments. (11/11/65)

D. VISITORS (Continued)

DECLASSIFIED

<u>Visitors</u>	<u>From</u>
<u>From AEC and Other AEC Contractors (Continued)</u>	
I. G. Rice	US-AEC
D. J. Pflaum	Washington, D.C.
<u>From Foreign Governments and Agencies</u>	
Mutsumi Kinoshita	Japan Atomic Fuel Corp.

Nature of Discussion

Classification.
(11/15/65)

Waste handling and de-
contamination methods.
(11/23/65)

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IV. SAFETY AND SECURITY

Operation:

Dis. Injuries
Ser. Accidents
Med. Treat. Inj.
Rad. Occurrences
Contam. Wds.
New Deposition Cases
Fires
Security Violations

<u>General</u>	<u>Purex</u>	<u>WMO</u>	<u>FEO</u>	<u>Redox</u>	<u>R&E</u>	<u>Finance</u>	<u>Prod.</u>	<u>Empl. Rel.</u>	<u>Total</u>	<u>YTD</u>
	17	9	8	6	2	1			0	1
	9	2		9				1	0	4
	1	1							44	416
									20	121
									1	22
									0	1
									0	4
									0	13

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V. REPORTS

A. PREPARED AND ISSUED

- RL-SEP-244 DEL (Unclassified), "Continuous Electrowinning of Plutonium Metal-Scaleup Studies: Progress Report", by T. S. Soine, dated April, 1965
- RL-SEP-269 (Unclassified), "Specifications and Standards for Operational Control of the Purex Self-Boiling Tank Farms", by FPPE, dated March 1, 1965.
- RL-SEP-649 (Unclassified), "Process Specifications and Standards - 242-T Evaporator Facility", by FPPE, dated September 1, 1965.
- RL-SEP-724 1 (Secret AWD), "Analysis of Isostatic Pressing Results 600 Type Parts", by I. N. Taylor, dated October 26, 1965.
- RL-SEP-778 (Secret), "Evaluation Report: FPT 64-22, Addendum 1; O3 Development Runs RED 25-6-301 through 310", by S. T. Field, dated October 18, 1965.
- RL-SEP-801 (Secret), "200 East Area Steam Considerations - Supply, Projected Requirements and Conservation Possibilities", by D. E. Peterson, dated November 25, 1965.
- RL-SEP-817 (Confidential), "A Summary of Investigations of the Plutonium Chemistry Laboratory", by H. H. Hopkins, dated November 1, 1965.
- RL-SEP-825 (Unclassified), "U-Pu Partitioning in the Plutonium Reclamation Facility", by L. E. Bruns, dated November 1, 1965.
- RL-SEP-829 (Unclassified), "Trip Report - American Chemical Society Meeting, Savannah River Laboratory, Oak Ridge National Laboratory, and Project Salt Vault", by J. J. Shefcik and P. W. Smith, dated October 29, 1965.
- RL-SEP-835 (Secret), "Accountability Factor for Buttons", by R. L. Walser, dated November 3, 1965.
- RL-SEP-836 (Unclassified), "Americium Purification Alternatives: A Literature Study", by R. S. Kingsley, dated November 1, 1965.

DECLASSIFIED

RL-SEP-874

DEL

A. PREPARED AND ISSUED (Continued)

- RL-SEP-841 (Confidential), "Trip Report: Mound Laboratory and Oak Ridge National Laboratory - October 12-14, 1965", by H. H. Hopkins and O. F. Hill, dated November 1, 1965.
- RL-SEP-840 (Secret AWD), "A-Line Product Characteristics - October 1965", by A. E. Smith, dated November 3, 1965.
- RL-SEP-831 (Secret AWD), "Weapons Process Engineering Technology Report - October 1965", compiled by members of WPE, dated November 3, 1965.
- RL-SEP-844 (Secret AWD), "Permanent Shape Mold Development Program", by C. M. Walker, dated November 9, 1965.
- RL-SEP-848 (Confidential AWD), "104-C Component Radius & Polar Height Inspection", by A. E. Smith, dated November 9, 1965.
- RL-SEP-851 (Secret), "Analysis of Neptunium Batches - Purex Nos. 36 and 38", by M. K. Harmon, dated November 8, 1965.
- RL-SEP-857 1 (Official Use Only), "Project Proposal, Rev. 1, Sludge Removal and Waste Transfer - 200-East Area - CAC-169", by C. A. Lyneis, dated November 17, 1965.
- RL-SEP-858 (Unclassified), "Uranium Decontamination Flowsheet - Plutonium Reclamation Facility", by L. E. Bruns, dated November 19, 1965.
- RL-SEP-864 (Secret), "Critical Mass Analysis of E-Metal Processing - Purex Plant", by J. B. Kendall and H. C. Rathvon, dated November 19, 1965.
- RL-SEP-868 (Secret), "Analysis of Neptunium Batches - Purex Nos. 38 and 39", by M. K. Harmon, dated November 23, 1965.

B. PREPARED FOR SIGNATURE AND ISSUANCE

- RL-GEN-30 (Secret), "HAPO Production Forecast, October 1, 1965 Through June 30, 1967", by W. E. Johnson, dated November 11, 1965.
- RL-GEN-31 (Secret), "Production - October 1965", by W. E. Johnson, dated November 17, 1965.

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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

J. H. Warren

General Manager
Chemical Processing Department

M-1

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END

**DATE
FILMED**

2 / 10 / 93