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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT
FOR

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AUGUST, 1964

Compiled By
OPERATION MANAGERS

September 21, 1964

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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HW-83876

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CHEMICAL PROCESSING DEPARTMENT
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I. SUMMARY

August production, as compared with the HAPO Production Forecast (HW-83319), is summarized below:

	<u>August</u>	<u>Fiscal Year To Date</u>
Separated plutonium nitrate	126	116
Separated uranium nitrate	118	112
Uranium oxide	98	100
Plutonium metal buttons	146	119
Fabricated parts	66	83

August production was highly satisfactory for all products, especially separated uranium nitrate. The combined output of separated uranium nitrate from Purex and Redox exceeded the previous record high (905.1 tons, June, 1963) by 5.9 tons. The low production of fabricated parts resulted from a reduction in delivery requirements by the AEC.

Purex processing was continuous except for two brief interruptions. The first outage was to replace a leaking jumper and the second was required to replace a steam valve. Otherwise, process performance was uneventful and near-record production was achieved for plutonium and uranium products.

The Purex canyon ventilation filter problem became more troublesome during August, requiring daily flexing of the filter during one period to maintain adequate flow. Continued compression of the bed was indicated by successive measurements of the level of the filter medium.

Recovery of aged promethium-147 from the 106-A Waste Tank progressed satisfactorily at a 100-kilocurie-per-week rate and with a yield greater than 80 percent. Earlier process difficulties were resolved by adjusting the pH during the precipitation step.

The HAPO I-B-1 cask was loaded with approximately 350 kilocuries of strontium-90. Cesium-137 loading of four STT casks was also started, with an additional STT cask being placed in series with the cesium casks for recovery of technetium-99.

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The Redox plant was shut down for the first eighteen days of August to replace two major pieces of equipment: the D-14 waste concentrator, which had developed a large leak on July 27; and the 1A precycle column, which had failed earlier.

The new waste treatment facility (Project CAC-912), the americium recovery facility (Project CAC-101), and the miscellaneous treatment portion of the plutonium reclamation facility (Project CAC-880) were placed in operation during August.

A project proposal revision and a revised construction budget data sheet for Fission Product Packaging Facility - B-Plant (Project CAC-981) were submitted to the AEC on August 6, 1964. The revised total cost of \$1,500,000, a reduction from the previous figure of \$1,850,000, was the result of decreasing the surveillance capability.

A preliminary project proposal, which requested \$60,000 for design of an addition to the Purex Analytical Laboratory, was transmitted to RLOO-AEC on August 12, 1964.

After the AEC gave approval to proceed with process design engineering criteria for the HIP plant, two process flow diagrams were completed for comment. Target completion date is October 15, 1964.

W. J. Gartin
for General Manager
Chemical Processing Department

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CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS

A. PRODUCTION OPERATION

1. Production Statistics

a. <u>Percent of Forecast⁽¹⁾ Achieved</u>	<u>August</u>	<u>Fiscal Year to Date</u>
Separated plutonium nitrate	126	116
Separated uranium nitrate	118	112
Uranium oxide	98	100
Plutonium metal buttons	146	119
Fabricated parts	66	83

b. <u>Purex</u>	<u>August</u>	<u>July</u>
Uranium nitrate produced (tons)	856	289
Average production rate during operation (T/D)	30	26
Total waste loss (%)		
Plutonium	0.28	0.50
Uranium	0.22	0.26
On-line efficiency (%)	99	51

c. <u>Redox</u>		
Uranium nitrate produced (tons)	54	147
Average production rate during operation (T/D)	5	7
Total waste loss (%)		
Plutonium	0.54	0.32
Uranium	0.42	0.31
On-line efficiency (%)	32	71

d. <u>Uranium Reduction (tons)</u>		
Normal UO ₃ loaded	676	256
Enriched UO ₃ loaded	102	0
Normal UO ₃ approved for storage	676	256
Enriched UO ₃ approved for shipment	102	0
Normal UO ₃ shipped	0	0
Enriched UO ₃ shipped	102	50
Normal UNH backlog	511	331
Enriched UNH backlog	185	232

(1) HW-83319, HAPO PRODUCTION FORECAST

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e. Plutonium Metal Processing

	<u>August</u>	<u>July</u>
Reduction yield (%)	97	94
Product recovery output (Kgs)	83	124
Product recovery backlog (Kgs)	1 380	1 365
Waste disposal (grams)	746	997

f. Power

	<u>200-East</u>	<u>200-West</u>
Raw water pumped (gpm)	11 333	5 152
Filtered water pumped (gpm)	1 175	1 204
Maximum steam generated (lbs./hr.)	222 000	92 000
Average steam generated (lbs./hr.)	196 861	61 551
Total steam generated (M lbs.)	146 465	45 794
Coal consumed (tons)	7 154	2 294

August production was highly satisfactory for all products, especially separated uranium nitrate. The combined output of separated uranium nitrate from Purex and Redox exceeded the previous record high (905.1 tons, June, 1963) by 5.9 tons. The low production of fabricated parts resulted from a reduction in delivery requirements by the AEC.

MK Harmon
Acting Manager, Production

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2. FISSION PRODUCT DATA

PUREX* RECOVERY	244-CR* INVENTORY	B-CANYON* INVENTORY	SEMIWORKS PRODUCTION	PRODUCT INVENTORY	PRODUCT IN CASK	PRODUCT SHIPPED	CUSTOMER	REMARKS
--------------------	----------------------	------------------------	-------------------------	----------------------	--------------------	--------------------	----------	---------

Sr-90
(Kilocuries)

380

1500

2220

350

Cs-137
(Kilocuries)

Ce-144
(Kilocuries)

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A-3

* Estimated figures based on Cs calculations.

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II. ACHIEVEMENTS (Continued)

B. PUREX OPERATION

1. Operating Continuity

Purex processed regular metal at a 3.6 capacity factor during the entire month except for two brief interruptions to replace a leaking 2 DW jumper (final uranium waste) on August 16, 1964, and a high pressure condenser vent steam supply valve on August 19, 1964.

Neptunium purification runs 18 and 19 were shipped during the month.

Recovery of promethium-147 from the suspended solids in Tank 106-A supernatant continued at the Purex Head End. Eight oxalate runs were completed and a ninth was in progress at month's end. Approximately 81,000 gallons of Tank 106-A supernatant were processed during August. Process modifications have improved recoveries. It is estimated that the last four runs resulted in the recovery of about 200 kilocuries of promethium-147.

Cerium-Rare Earth separation tests were performed early in the month at the Strontium Semiworks, using 2800 liters of promethium crude from the 002 CR Vault. The test runs, using the persulfate oxidation process and new organic, were very successful.

Approximately 14,000 liters of promethium crude were transferred from the 002 CR Vault to the Strontium Semiworks. The material was concentrated for storage in preparation for a promethium separations run.

B Plant processing was limited to agitator tests to determine the amount of decayable oxalate solids present as opposed to non-decayable solids in Tanks 11-1, 8-2, and 6-2.

2. Processing Operation

Purex uranium met specifications with silica gel treatment and plutonium was in specifications except for periods when the plutonium stream was diverted from the ion exchange unit during rupture disc replacement.

The HAPO I-B-1 cask, which was shipped to the Oak Ridge Laboratory early in July, was returned on August 10, 1964. The cask was placed in D Cell at the Strontium Semiworks and has been loaded with approximately 350 kilocuries of strontium-90.

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The four STT casks were received during the month and loading of the first cask with cesium-137 was completed on August 31, 1964. An additional STT cask has been placed in series with the cesium casks for loading of technetium-99.

3. Equipment Experience

The Purex canyon ventilation filter became more troublesome, requiring daily flexing during one period to maintain adequate flow. The total differential pressure ranged up to 11.9 inches of water and the flow at one time fell off to 73,000 cfm. Continued compression of the bed is indicated by successive measurements of the level of the filter media.

Several rupture discs were replaced in the plutonium ion exchange unit during the month. New platinum vacuum-supported discs are being developed.

Three pipe hangers supporting the main 12" steam supply line to the west end of 202-A Building pulled loose from the building wall. This allowed the line to drop approximately 12" and come to rest on the roof over the PR dock. The three failed hangers and a fourth undamaged support were modified and strengthened and the steam line was put back in service.

A ten-ton rotating hook of a new design was modified and installed on the Purex West Canyon crane. The hook is operating satisfactorily.

The number one Purex process air compressor developed leaks in the after-cooler allowing water to get into the compressed air line. The after-cooler was regasketed and the unit returned to service.

The 202-A Building breathing air compressor failed due to an overheated bearing. The unit was completely overhauled, including replacement of all bearings and seals, and returned to service.

A new 125-HP electric motor was installed in the Tank 102-A sluice pump assembly early in the month and sluicing was started on August 19, 1964. However, on August 28, 1964, another motor failure was experienced. An investigation is being conducted to determine the exact cause of the failure. A new motor has been ordered.

A failed HA column waste valve and HC column product rotameter have been removed and replaced in B Cell at the Strontium Semiworks. Personnel exposure has been reduced by a factor of ten in the cell by using a lucite greenhouse equipped with leaded rubber gloves.

Jumper installation for the Tank 112-BY to Tank 101-BY routing for the In-Tank Solidification program was started this month. Acceptance tests on the solidification unit at the BY Farm were initiated during the week of August 10, 1964.

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4. Radiation Experience

Addition of Bentonite to the Gable Mountain Swamp was continued in August. Water flow to the swamps was adjusted to hold the liquid levels constant. The backfilling of the old "B" Swamp ditch was completed on August 14, 1964.

One bucket of green metal received at the Purex Plant from the Irradiation Processing Department was detected by crane operator observation and confirmed by the railroad tunnel monitor. The bucket was temporarily stored in the Purex storage basin and then returned to the Irradiation Processing Department.

^{131}I emission was normal for Purex activity conducted during the month.

5. Analytical

Analytical support was provided for the current promethium recovery campaign being conducted at the Purex Head End and also for the cesium and technetium recovery program at the 801-C Facility. The material balance across the promethium recovery process has fluctuated from 45 to 100 percent, depending on the representativeness of the Tank E-1 product sample.

Manager-Purex

WM Harty:MLM:gt

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (Continued)

C. REDOX OPERATION

1. Operating Continuity

The Redox plant was shut down the first eighteen days of the month to replace two major pieces of processing equipment, namely: 1) the D-14 waste concentrator which developed a large leak on July 27; 2) the 1A precycle extraction column which had failed earlier. Both units were replaced without incident and operations were resumed on August 18.

The Uranium Oxide plant operated at satisfactory rates throughout the month. However, enriched UO_3 powder production was below expectations, due to a filter bag rupture which required a shutdown for replacement of the failed unit and clean-out of the powder handling system.

2. Processing Operations

a. Redox Processing

Operations were resumed on August 18, following a planned eighteen-day outage to replace the D-14 waste concentrator and the 1A pre-cycle extraction column. Both units had developed excessive leaks during July. The initial start-up was very erratic and was accompanied by high waste losses which required diversion of the plant to waste rework on August 24. Virgin feed processing was subsequently resumed on 8-26 and was continuous until 8-30. At this time processing was discontinued in order to replace the control valve jumper between the 1A column and the D-14 waste concentrator which was restricting column operation to a 60 percent rate. By month-end the new valve jumper had been installed and processing was resumed on 9-1-64.

While preparations were being made for the 1A column replacement the accountability acid flushes for the quarter were made. Significant quantities of plutonium were recovered (about 1.7 Kg) from the partition cycle 2D column. The plutonium deposition probably occurred during periods of operation with excessive acid-deficient partition cycle feed.

b. Uranium Oxide Processing

Enriched uranium powder production was below expectations this month due primarily to the rupture of the X-3 filter bag. The downtime required to replace the filter bag and clean out the powder handling system adversely affected production rates.

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All UO_3 powder produced during the month was within shipping specifications. A few batches of enriched start-up feed were above specifications in iron content but by month-end had been satisfactorily blended into specification material.

3. Mechanical Experience

a. Redox Plant

The major maintenance activity this month was directed toward replacement of the failed D-14 waste concentrator and the 1A precycle column. Although the contamination potential on both jobs was exceedingly great, removal and replacement of both units was completed without incident and good radiation control was maintained throughout.

Thirty-one jumpers were installed in the canyon cells and silo during the month; nineteen new ones and twelve replacements. Most of the jumpers were in connection with the D-14 and 1A replacements.

During the shutdown a redesigned Lawrence pump was installed in the F-7 metal solution feed tank and operating experience to date has been very favorable. The new pump features a design which excludes the bearings from contact with the process solution and permits recirculation of vessel contents.

4. Waste Handling and Decontamination

A steady increase in radioactivity was detected in two of the horizontal laterals beneath the 108-SX waste storage tank this month. (Maximum 150,000 c/m at month-end.) The high readings have been detected at localized spots with very little change at other locations. A reading of 5,000 c/m in vertical test well No. 29, detected early in the month, remained unchanged at month-end. It is felt that the increase in radioactivity may be due to a leaking transfer line and all such lines in the vicinity of the 107 and 108-SX tanks are to be tested as soon as scheduling permits. In the meantime, close surveillance will be kept to detect any changing trends.

5. Radiation Experience

Extensive flushing of the failed 1A column and associated jumpers using alternate solutions of caustic-permanganate, nitric acid, chrome nitrate and ammonium fluoride, successfully decontaminated the equipment to nominal radiation levels for ease of handling in burial. Radiation readings on the 1A column were reduced from 360 to 80 R/hr at a distance of two feet. The column, enclosed in a burial capsule, was removed from the building and buried without incident. The maximum exposure rate to personnel during the entire operation was 400 mR/hr, encountered while the burial capsule was being coated with plastic resin. The resin coating was applied as an added precaution to prevent the spread of contamination.

The failed D-14 waste concentrator was removed from the Redox canyon and transferred to the 221-U Building, via railroad car, without incident. The radiation exposure dose rate, at 200 feet from the concrete equipment transfer box, was 60 mR/hr.

6. Analytical Experience

The Redox Analytical Laboratory provided: 1) Pm-147 and Ce-144 analyses in support of the Pm-recovery facility operated by Separations Chemistry, Research and Engineering Operation; 2) thorium analyses in various di-ether extractants and total nitrate analyses to provide data for the waste solidification program study for the Materials and Process Chemistry Laboratory, HL; 3) Ce-Pr 144 determinations and alpha pulse height analyses for the Quality Control Operation, Weapons Manufacturing Operation, to assist in evaluating their Americium recovery flowsheet; 4) special X-ray spectrometric analyses for nickel in UC_3 powder samples to assist in resolving variances in specification analyses.

S. D. Smolen
Manager - Redox

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II. ACHIEVEMENTS (Continued)

D. WEAPONS MANUFACTURING OPERATION

1. Operating Continuity

The fabrication of Model 1807 components and Model 74-C components was without significant interruption. A portion of the fabrication effort was devoted to the testing of new processes on the "A" line. The preparation of unfabricated plutonium metal was normal with one significant (40 hour) interruption resulting from contamination from a burst air line strainer. The new reclamation facility operated at low rates during the month. Difficulties with plugged lines continued to prevent normal operation of the slag and crucible dissolver. The new waste treatment facility (CAC-912) and the americium facility (CAC-101) were started up during the month but progress was limited because of flow and process problems. The laboratory-type dissolvers operated all month. The incinerator operated until August 19 at which time it was shut down for the balance of the month for scheduled inspection and maintenance.

2. Processing Operations

a. Plutonium Fabrication

Information on plutonium fabrication activities is presented in Document HW-83991 (Atomic Weapon Data).

b. Plutonium Reduction

Operation of the button line was normal during the month.

It is no longer necessary to dispose of scrap powder by combining it with the slag and crucible fragments. This material (sweepings) is now sealed out separately for dissolution in the new miscellaneous treatment facilities which were started during the month.

c. Plutonium Reclamation

The reclamation facility delivered 71 kilograms of product to the button line during the month. Thirteen kilograms of this came directly from the oxide dissolvers.

All of the cans of scrap solutions except Fabrication oil were processed during the month.

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c. Plutonium Reclamation (Continued)

The laboratory-type oxide dissolvers processed a total of 72 kilograms of plutonium during the month.

The incinerator processed 40 boxes of waste and nine additional packages of leachables.

The new miscellaneous treatment equipment (a part of Project CAC-880) which was started this month, delivered 18 kilograms of plutonium to the extraction system.

3. Mechanical Performance

Fabrication and inspection equipment performed satisfactorily during the month. The air-cooled blower on HC-19-B1 failed and was replaced with a water-cooled (stokes-type) blower.

Hood HC-24 (a highly contaminated, 13,000 lb. Gorton Iathe Hood) was disconnected from the "C" fabrication line, transported around the outside of the 234-5 Building and connected to the "A" fabrication line, without incident.

On the button line, the fracture of a plastic sediment bowl on the 90 psi compressed air line resulted in damage to a sight glass on one of the furnace hydraulic systems. Contaminated oil was spread throughout the Task III (furnace) and the 9-B (continuous Pu processing unit) areas. Replacement of the plastic sediment bowls with metal is scheduled.

Major maintenance work on plutonium reclamation equipment consisted of the following: the dismantling of the 06 dissolver, chiseling out approximately three feet of solids, and reassembly of the unit; inspection, repair and modification of the incinerator; replacement of Chempumps in the reclamation facility.

Correction of flow rates in the new waste treatment facility has been complicated by the Pipefitters' strike.

In the analytical laboratory, the mass spectrograph lost 90 operating hours because of failures in a mechanical pump, a diffusion pump, and a potentiometer in the repeller circuit. The emission spectrograph has suffered a loss of power which is still unresolved at month-end. A manufacturer's service representative is scheduled on plant September 2 to assist in this problem.

4. Radiation Experience

Radiation and contamination control statistics reveal that the improvement achieved in July was maintained through August.

There were no cases of potential plutonium deposition this month.

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5. Analytical Experience

Number of Samples Received	3,247
Number of Determinations	22,405

Startup of the 912 and 101 projects (waste treatment and americium recovery) and a continued heavy load from the 880 project (plutonium reclamation) resulted in the increased laboratory requirements, and necessitated 4.9% overtime.

Manager
Weapons Manufacturing

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (Continued)

E. FINANCIAL OPERATION

1. Production Cost Accounting

The Atomic Energy Commission informally advised that Isotope Inventory funds were being increased \$1,000,000. This will permit the department to continue operation of fission products work with no cut-back from existing level of effort and work-force as would have been necessary under the initial allocation.

Cost accumulation and Isotopes Inventory accounting work performed by Contract and Accounting Operation were transferred to CPD, Financial Operation, in August along with seven employees who were performing this work under C&AO.

The Initial Allocation of Funds, considerably reduced from FY 1965 Revised Budget, was allocated to section level in the department and reported on the operating statements. Managers have been made fully aware of the tightened fund situation.

Special requests handled during the month included the shipment of 1 Kg of Pu metal to Monsanto Research Corporation and the burial of 46 drums of contaminated material for Dow Chemical Company.

2. General Accounting

As of July 31, 1964, costs incurred by nineteen active projects totalled \$3,159,909 against authorized funds of \$6,026,424. Outstanding commitments totalled \$449,411.

During the month of August two appropriation requests totalling \$18,925 were authorized. In addition, two other AR's totalling \$55,030 were routed for management approvals.

3. Auditing

An audit memo was issued in August pointing out areas where possible savings may be realized in department travel costs.

Data relating to telephone installations was developed and issued with recommendation that a review of telephone usage be made prior

to the next instrument count.

4. Business Programs

The CPD portion of the Refined Reactor Cost Studies was finalized and submitted to Contract Accounting for use in their data processing program. The supplemental waste management document is being prepared and will be issued in September.

The CPD Data Book was revised and updated to include FY 1964 activities. The Data Book will be issued in September, when the new covers are received from printing.

Waste Management and Fission Product Integration - The financial data for the various flowschemes currently being considered for B-Plant operation were provided for inclusion in the integration study.

RACornell
Manager - Finance

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CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (continued)

F. FACILITIES ENGINEERING OPERATION

1. Purex

a. Process Design Engineering

E-6 Neutron Monitor

The E-6 neutron monitor jumper was installed in the Purex canyon on August 21. Preliminary checks indicate that both neutron detectors (there are two neutron detectors in the jumpers; one has a built-in pre-amplifier, the other does not) are operable; further checking will be required before this can be confirmed.

Multipurpose Dissolver Dump Tests

Tests to date indicate that NRD fuel elements up to 24-inches long can be dumped from the canister into the dissolver having a 12-inch or an 8-inch annulus. Also, NRD elements up to 20 inches long can be dumped into a 5.5-inch annulus. Further tests and studies are being made to confirm the desirable annulus.

Thorium Processing - Purex

Process design work started on the preparation of design criteria for thorium processing in Purex. The main process modifications to be provided in order to process thorium in Purex include:

- 1) Acid boil-off of metal solution in head end facilities and acid recovery in "U" Vault.
- 2) Replacement of the J-4 Column with a C-type column.
- 3) Re-activation of the WR Vault, or similar storage facilities, for the storage of thorium nitrate solution.

Purex multipurpose dissolvers are scheduled to be used to dissolve the irradiated thorium for U₂₃₃ production.

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This will necessitate some modifications to the Purex multipurpose dissolvers due to the nature of the thorium fuel elements. Additional laboratory work is being done to define the parameters and needs of thorium dissolution.

Purex "N" Cell Alteration

Drawings have been prepared for a product concentrator and product receivers for "N" Cell improved product quality. An order for this equipment should be placed shortly. The utilization of ion exchange to remove the silica from the make-up water is being examined as an alternative to a steam condensate system. Inconel rupture discs with stainless steel supports installed in the AX and XC Columns have lasted longer than the solid stainless steel ones. However, the test program on Inconel is not fully conclusive.

b. Project Engineering

CAC-152 - Analytical Laboratory Additions - Purex

A preliminary project proposal requesting authorization of funds in the amount of \$60,000 for design was transmitted to AEC-RL00 on August 12.

c. Manufacturing Engineering

Sanitary Water Line - 291-A

Electrical potential checks between the sanitary water line and the cathodic protection system were made. Results indicated that potentials are of the correct polarity and stray currents from the cathodic system are not contributing to the corrosion of the line. Similar results were obtained on the condensate line.

2. Redox

a. Process Design Engineering

1A Column Decontamination Effectiveness Monitor

On August 9, decontamination of the Redox 1A Column (in preparation for its removal) was started and was completed on August 13. A monitoring system was provided to determine the effectiveness of the decontamination. A TP instrument with a remote probe suspended from the silo crane auxiliary hook was utilized successfully.

Backflow Prevention Valve

Design on a backflow prevention valve for the sanitary water system in 222-S Building was completed. An estimate by the J. A. Jones Company for installation was \$4,558.

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Process Jumpers

New Drawings have been prepared for a new organic flow route to D-14 tower. Two jumpers are involved. Flow routings from 1A overflow to D-14 via "F" Cell have been reviewed and preliminary data for design generated.

b. Project Engineering

CGC-929 - NPR Fuels Processing Facility - 200-W Area

The 3-inch UO_3 powder line is in operation. All drawings and data sheets for remaining work have been received from Vitro Corporation for comment.

3. Weapons Manufacturing

a. Process Design Engineering

"C" Button Line - 234-5 Building

The program of reviewing the existing button line has been completed. Totals of 2,319 drawings and 192 blueprints were voided. Testing and evaluation of the jaw crusher, intended as a replacement for the hammermill in glove box HC-17DC, are scheduled to begin soon. Comment prints have been completed on the plutonium oxide removal station in glove box 9B. A new drawing was issued for stainless steel, modular-type window glove box arrangement replacement panels for HC-9B. This design was prompted by the successful application of a prototype test panel installed about three months ago.

Plutonium Reclamation Facility

A hazards evaluation was made for Miscellaneous Treatment Room glove boxes 1 and 2 (skull burning and dissolving). Recommendations were made (document HW-83641) concerning better control equipment and modifications.

A study program for Chempump failure has been established. Besides seeking improvements to Chempumps, the group is considering use of other chemical process pumps. One type, (Ingersoll-Rand with a mechanical seal) has been purchased for testing.

Incinerator Facility

During a scheduled shutdown, the Incinerator Facility is being cleaned and inspected for cracks and other possible defects. The water fog fire extinguisher in the chopper section has been fabricated and tested. It will be placed in operation as soon as control circuits can be completed.

HC-24C Machining Hood

Glove Box HC-24C complete with its contents - two Gorton and one Stetson-Ross lathes and related equipment - has been safely moved and connected to A Line, where it becomes HA-39. Re-connecting of electrical, ventilation, and hydraulic services is being done.

Triple Unit Counter (Alpha Simpson Proportional)

Initial tests met and exceeded the 234-5 Laboratory requirements. Following the initial period of operation, both units failed because of an improperly fabricated cable connector. However, the imperfect cables have been repaired and a protective circuit added. These and the third unit are ready for installation, since all noise problems have been eliminated. Based on the preliminary operation, it appears that these units are capable of providing extremely accurate data during routine analysis. The data appear comparable to that obtained with the instrument in operation at Redox Laboratory.

b. Project Engineering

CAC-987 - Metal Stabilization Facility - 234-5 Building

All vendor drawings have been received and approved. Purchasing liaison is exerting full effort to expedite materials. Present delivery date of November for the isostatic press may delay project completion.

4. General

a. Process Design Engineering

Monitors in Waste Storage Tank Farms

Both vertical well monitors failed because of cable breakage on the cable reel auxiliary drums. The cables are being repaired, but monitors will not be returned to service until causes of breakage can be remedied. The operation and maintenance manual for the monitors is being held to incorporate these corrective procedures.

Air-Conditioned Plastic Suits

The "plastic-man" suits including vortex cooling tubes are being modified for application to new construction facilities. Two types of personnel entry and exit ports are being developed. An evaluation of five types of commercially available plastic footwear has been made. The conclusion was made to continue the procedure of wearing standard rubber overshoes over the sealed plastic legs. The overshoes are easier to change at barriers and can be decontaminated more economically.

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Waste Management and HIP Integration

A meeting was held with the Commission concerning HIP design parameters, and approval was received to proceed with process design engineering criteria. Two process flow diagrams have been completed for comment. A schedule has been prepared with October 15 as a target completion date.

221-B Cask Station

The design criteria document was transmitted to the local Commission on August 14.

Waste Management Packaging Equipment

The problems of fabrication schedule and testing have been reviewed at the request of the Commission. Conclusions are that if material deliveries do not lag further, and if testing proceeds as expected, the schedules can be met. The vendor estimates that limited testing of the welding torch may begin around mid-September. A tentative basis for cask surveillance criteria to serve during the hot demonstration in "B" Plant has been established. Fabrication of the airlock is anticipated by September 12.

b. Project Engineering

Project Cost Information - as of 8/23/64:

Total Authorized funds - 19 active projects	\$ 6 066 000.
Total Cost-to-date	3 190 000.
Commitments and Open Work Releases	553 000.
Unencumbered Balance	2 323 000.
Costs Charged to above projects 7/19 to 8/23/64	53 000.

CAC-981, Rev. 3 - Fission Product Packaging Facility - B Plant

A project proposal revision and a revised construction budget data sheet describing these facilities for a total cost of \$1,500,000 were submitted to the Commission on August 6. The reduction from the previous figure of \$1,850,000 was accomplished by reducing the degree of surveillance capability incorporated into the project. This action is in accord with Commission ceiling for this project.

5. Shops Operation

Normal services were provided to operating facilities as required. Major Shop work progress and/or completions were as follows:

Boiler Shop:

Completed the carbon steel Purex Multipurpose Dissolver Mockup and tested fuel element charging with various slug lengths and annular openings. This shop also fabricated two tube bundle burial capsules and completed preparation of the Spare 1-A Column for Redox installation.

Sheetmetal Shop:

Fabricated and installed a replacement off-gas filter assembly in 201-C Building, a viewing window assembly in the control room at 241-CR Tank Farm, and fabricated a Flame Spectrometer Hood for 222-S Building.

Motor-Re-wind Shop:

Re-wound the 250 horsepower motor for the 282-E Building in seven days. This job is normally performed in nine days.

Machine-Tool and Die Shop:

Continued a heavy workload on inspection devices for Weapons Inspection, notably a spindle tester, an internal measuring device, and gages.

Jumper Shop:

Completed 35 jumpers, 24 of which were for Redox and 11 for Purex. A dissolver heater assembly for the Plutonium Reclamation Facility was fabricated and shipped off-site for plastic coating.

Rotating Equipment Shop:

Completed the F-8 Redox pump, and replaced it on an emergency basis. This shop also completed preparation of an agitator and two pumps for Purex, as well as numerous smaller equipment items.

6. Power and Services

There were no interruptions of steam or electrical services that affected continuity of operating production facilities. Redox high tank has been renovated and returned to service. The ventilation balance crew checked confinement flows of all 105 Reactor Buildings. This crew continued work in 109-N Building and set final air flows in the Zone III System.

HP Shaw:olc

[Signature]
for Manager - Facilities Engineering

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CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (Continued)

G. RESEARCH AND ENGINEERING OPERATION

1. Purex Process Engineering

a. Feed Preparation

Steaming in a cask car well and the alertness of a crane operator prevented the charging of a short-cooled bucket of irradiated metal to a dissolver. An alarm has been installed on an existing ion chamber located in the railroad tunnel. Based on data collected over the last several months, the ion chamber can be useful in preventing the charging of metal cooled less than 100 days. A prototype neutron monitor was installed on the HAF Feed Make-up Tank((TK-E6) to detect in-tank plutonium levels and improve critical mass control. Two independent signal transmitting systems were provided using a special multihead prototype jumper. The systems were identical except that one had the preamplification system located in the cell jumper while the other had the pre-amplification system located in the Pipe and Operating Gallery. Thus far, the better performance has been obtained with the pre-amplification equipment located in the Pipe and Operating Gallery.

b. Solvent Extraction

A plant process test using sodium formaldehyde sulfoxylate as a substitute for ferrous sulfamate in the 2D Column was terminated after 24 hours because continuing laboratory tests showed that under certain conditions, severe corrosion of stainless steel can occur.

c. Product Treatment

Three and four-inch Inconel rupture discs with stainless steel vacuum supports were installed in the emergency relief system of the plutonium ion exchange unit. The service lives of three XA Column four-inch rupture discs were 12, 7, and 3 days. The first XC Column three-inch rupture disc failed after 19 days of operation. Failures apparently continued to be associated with disc flexing.

After six weeks of test operation, a 100-micron polypropylene sock filter located in the product stream of the plutonium anion exchange stripping column was replaced with a 40-micron polypropylene sock. The 100-micron filter contained a very small quantity of resin and a few metal turnings.

d. Waste Treatment

The IWW High Level Waste Concentrator (E-F6) capacity is currently limited by the pressure drop across the tower of the concentrator and the downstream Acid Absorber (T-F5). No noticeable loss of heat transfer has occurred with the two titanium tube bundles now in the concentrator.

Sluicing operations in TK-105-A were resumed after replacing the 102-A sluice pump motor. The new motor failed, however, after only 15 hours of operation.

e. Fission Product Recovery

The special processing campaign to recover aged promethium from suspended sludge in TK-106-A is progressing satisfactorily after resolution of process difficulties with the oxalate precipitation step. Process studies showed that the rare earths would not precipitate at acidities higher than a pH of 4.0; this is in sharp contrast to routine processing experience with rare earth oxalate precipitations at B-Plant. Campaign recovery rates are approximately 100 kilocuries per week with nominal yields of greater than 80 per cent and material balances of 50 - 100 per cent.

Two batch process tests were made at the Strontium Semiworks to evaluate the use of a straight chain hydrocarbon diluent in the silver-persulfate process for separating cerium-IV from the other rare earths. Previous operations and laboratory studies showed the process was sensitive to diluent degradation products. The tests with the special diluent were highly successful with greater than 99 per cent of the cerium remaining in the solvent phase after contact periods of up to 9 hours.

2. Redox Process Engineering

a. Plutonium Deposition in the Partition Cycle Codecontamination Column

During the report period the process equipment was flushed with concentrated nitric acid; 250 grams of plutonium were removed from the partition cycle codecontamination column (1A Column) and 1450 grams of plutonium were removed from the overflow line. Deposition is related to acid control in the organic phase in this column. An acidified organic stream (1A0) was introduced into the scrub section of the 1A Column as a deposition control measure in July, 1962. Until recently this measure had been effective in controlling deposition in the scrub section of the 1A Column and overflow line. A review of the data for the period preceding the flush revealed loss of acid control in the partition cycle feed and a corresponding reduction in the concentration of plutonium in the LBP.

b. HA Column Decontamination

During the report period the HA Column (with the leaking feed line) was given the following decontamination flushes prior to replacement:

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<u>Flush</u>	<u>Radiation Reading</u> (3 feet from the feed entry nozzle)
1. 5% NaOH-0.75% KMnO_4	360 R prior to flushing
2. 10% HNO_3 -2.25% $\text{Cr}(\text{NO}_3)_3$	
3. 57% HNO_3	300 R at completion of flush
4. Series repeated	190 R at completion of flush
5. 20% HNO_3 -6% NH_4F	160 R (background)
6. 40% HNO_3	160 R (background)
7. 5% NaOH-0.75% KMnO_4 (repeated once)	160 R (background)
8. 10% HNO_3 -2.25% $\text{Cr}(\text{NO}_3)_3$	160 R (background)
9. 40% HNO_3	160 R (background)

(Velocity water flushes were made between each chemical flush.)

Traverse gamma measurements of the column were made during the flushing operation using a high range TP probe from the crane. The high background reading interfered with an evaluation of the effectiveness of the final flushes. The maximum radiation reading from the column upon removal was 2 R at the capsule in the region of the interface level and feed point. Other sections were less than 1 R.

c. Acid Deficient Precycle Flowsheet

Following the replacement of the D-14 (HABS) concentrator and the HA Column, the acid deficient precycle flowsheet was adopted. On this flowsheet the feed solution is processed through the HA Column on an acid deficient flowsheet with the HA raffinate routed to the HABS concentrator. The concentrated HABS solution is recycled to the HA Column to provide salt and a portion is routed to the HS feed tank (F-8) and processed through the HS Column on an acid flowsheet to recover neptunium.

This flowsheet provides better decontamination of the fission products and a lower rate of corrosion of the HABS concentrator. The HS raffinate is discarded as waste and is the principal extraction battery waste stream. Thus far extraction losses via the HSW stream have been less than 0.1 per cent for plutonium and uranium and less than 10 per cent for neptunium based upon input as new feed solution. Both the final uranium and plutonium product solutions have been well within gamma specifications on the new flowsheet.

3. Plutonium Process Engineering Operation

a. Recovery

The accumulation of undissolved solids in the slag and crucible dissolver reported for July was manually removed from the partially disassembled

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dissolver. Approximately 12 liters of solids were removed, containing approximately 500 grams of plutonium as determined with a portable gamma counter. The predominant chemical constituents of the solids were determined by emission spectrograph to be calcium, magnesium, and aluminum. Since the solids were pink in color, the plutonium was assumed to exist as PuF_4 . Based upon laboratory dissolution studies on the solids, dissolver operating procedures were modified to incorporate a periodic 4-molar nitric acid flush, which converted the hard solids to an easily slurried material. At month end, evidence indicates the dissolver may again be plugging. Dissolution studies are being conducted in Plutonium Chemistry Laboratory, and hydraulic studies are to be conducted in the Cold Semi-Works in attempts to solve this pluggage problem.

"Hot" start-up was initiated on August 6, 1964, in the Waste Recovery Facility and Phase I (americium isolation, partial purification, and concentration) of the Americium Recovery Facility. Hydraulic problems, plutonium stripping problems, and material balance problems have hampered initial operation. The present system for flow of Reclamation Facility aqueous waste (CAW) to the Waste Recovery solvent extraction column (CW) will handle only about 1/3 of the flow generated by the Reclamation Facility.

Data to date indicate that the DBBP column is effective in stripping the plutonium from the CAW. Based upon CAW stream samples and final waste batches, approximately 80 per cent of the CAW plutonium has been held up in the DBBP column. Stripping operations to date have returned 70 grams (of approximately 200 fed to the DBBP column) of plutonium to the Reclamation Facility. The rest of the plutonium remains in the solvent extraction system. Studies are in progress aimed at (1) improving the stripping contacting efficiency, and (2) improving analytical and sampling methods such that better plutonium material balances can be made in the low plutonium content system.

The amount of americium present in the Reclamation facility's waste solution is very low, since the plutonium scrap processed has not aged appreciably. The amount of americium present approaches the detection limits in the feed solutions. Consequently, quantitative evaluation of americium recovery is not possible. Indications are that americium is being recovered, since activity is building up on the ion exchange column.

4. Separations Chemistry Laboratory

a. Purex Process Improvement

Alternate Reductants

The proposed use of sodium formaldehyde sulfoxylate (SFS) as a reductant in the Purex process became a questionable method when corrosion tests with 304 L stainless disclosed that SFS- HNO_3 mixtures are very corrosive. Laboratory work is continuing to obtain more detailed knowledge of the corrosion properties.

Additional mini-mixer runs were made to determine the possibility of using SFS in place of ferrous sulfamate in the 3A-3B columns during the neptunium accumulation run. Results disclosed only nominal losses of

1.5 per cent Np across the cycle. A further test simulating the 3A column during the decontamination step was made in the absence of uranium. Waste losses rose to 84 per cent indicating the need for some uranium in the system or some other appropriate revision to the flowsheet.

b. Redox Process Improvement

Neptunium Oxidation Rates

Rates of neptunium oxidation to the VI state by sodium dichromate in low acid solutions containing high aluminum and sodium nitrate salts have been determined. At free acid values above 0.3M HNO₃, at a temperature of 55 C, essentially complete oxidation is obtained in less than 3 minutes. Rates significantly decrease as the free acid value is reduced.

c. Fission Product Process Improvement

Rare Earth Oxalate Precipitation

Poor recovery during the rare earth oxalate precipitation in the Hot Semiworks was investigated in the laboratory and was found to be due to excessive hydrogen ion concentration. Control of the precipitation step was found to be possible by adjusting the hydrogen ion concentration to 1M (including that contributed by the oxalic acid) and alternatively by adjusting the pH of the rare earth oxalate mixture to pH 4 by adding caustic.

Promethium Purification

A simulated promethium purification run is in progress in the chromatographic ion exchange facility using yttrium as a stand-in for promethium. Other materials added to the feed to provide a broader base for evaluation of the process consisted of equal weights of copper, zinc, samarium, neodymium, cerium, and iron.

After loading the feed on the first column, elution was started using 0.035M DTPA at pH 6 as the elutriant. Good separation of the elements is apparent at the bottom of the second column with the iron in the leading edge. Therefore, it appears very promising that the promethium section can be fairly well isolated at the bottom of Column 2 for further purification in Columns 3, 4, and 5.

Cold testing has indicated the need for revisions before introducing hot material to the unit. These include replacement of the silicone jacket gaskets with rubber, provisions for removing precipitated materials from the transfer lines, and inclusion of piping revisions which will permit a higher degree of isolation for individual columns in the series.

d. Laboratory Improvement

Chromium Content of Loaded Resin

A procedure has been developed to determine the chromium content of anion exchange resin. The procedure utilizes sodium formaldehyde sulfoxylate to remove the chromium from the resin. Use of this reductant permits the

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determination of chromium without interferences while using routine spectrophotometric procedures with only slight modifications.

DTA Resin Tests

Permutit SK in dichromate form was loaded with 53 grams of plutonium per liter of resin. A thermogram showed deflagration at 214 C, while the same resin in nitrate form, and loaded with plutonium deflagrates at 191 C. Gas, released into the bell jar by the chromate form resin, was ignited by the sparks resulting from deflagration, burning insulation on the electrical leads and oxidizing the sample thermocouple. After stripping plutonium from the resin with dilute nitric acid, the deflagration occurred at 210 C, characteristic of Permutit SK in nitrated form. The plutonium-loaded dichromate form Permutit SK showed significant decomposition within two weeks. The beads were very tacky and associated with a dark viscous organic material. Within three weeks no bead forms were detectable.

Two loadings of plutonium on Permutit SK were sealed in 4 mm diameter analysis tubes with Sauereissen cement. By DTA analysis, the 37 g Pu/liter of resin loading did not deflagrate, while the 72 g Pu/liter of resin loading deflagrated at 192 C. Unsealed control samples of both loadings deflagrated at 191 C. All samples were loaded without aqueous phase.

Statistical Study of Metallic Impurities

A multivariate regression to determine the relationship between spectrographically measured impurity elements and plutonium button density was computed using the "George" program for acceptable production from November, 1963, through April, 1964. The measured impurities accounted for one-third of the observed density variation with Al, Cr, Fe, Mn, and Ni having a significant (at the 99.5 per cent level) effect on density.

Atomic Absorption Spectrophotometry

A new hollow cathode lamp which can be disassembled has been constructed to overcome the unsatisfactory performance of the sealed lamps. The sealed units must be operated at low currents, resulting in low intensity to assure long tube life and one sealed tube is required for each element. The new lamp can be used for most of the elements by simply changing the inexpensive hollow cathode. Cathodes have been prepared for Pb, Cu, Fe, Ni, and Si which appear to be as intense and as stable as the sealed commercial lamps.

5. Plutonium Chemistry Laboratory

a. Dissolution of Dissolver Solids

The solids which have plugged the slag and crucible dissolver (Tank 06) were examined for composition and susceptibility to dissolution. The solids were quite resistant to total dissolution, but in 4M HNO₃, the large particles were rapidly broken down into fine sand which can be slurried for removal. A spectrographic analysis has shown that the

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major constituents of the solid material are magnesium and aluminum, with no silicon present. A more detailed examination of the composition of these solids will be made to clarify the composition.

b. Off-Gas Solids Treatment

A flowsheet has been written for the dissolution of plutonium in solids formed during treatment of incinerator off-gas. It is designed to couple with the present incinerator ash dissolution flowsheet for incorporation into the 880 feed stream.

c. Electrorefining Cells

Ceramic stirrers (LS-31) were successfully produced. They were solid cast, using a three-piece split mold, of Mix 41 and Mix 32 magnesia-magnesium titanate, and also standard low-density magnesia. The sintered and oxidized titanate stirrers have superficial surface cracks which are believed unimportant. The pure magnesia stirrers have not yet been sintered.

The cementing problem in LASL-type double crucible cells appears to be solved. As the report period ended, one flat-bottom cell and one curved-bottom cell, each made of Mix 41 titanate, were successfully induction furnace sintered. The inner cup in each case had been cemented to the large outer crucible shortly after casting, using slip. Both are now being oxidized.

d. Americium Recovery

Experiments are being completed on the final purification of the Phase I solvent extraction product by the high-salt flowsheet.

A demonstration purification run was completed. The feed solution contained 100 mg each of Am, La, Ce, Pu; 10 mg each of Th, U; 46 mg Ga; 3,400 mg Fe; 2,000 mg Mg; 1,200 mg Ca. The total americium recovery across the entire flowsheet was 81 per cent and the material balance for the run was 92 per cent. Americium dioxide was prepared by oxalate precipitation and calcination from the product solution. The AmO_2 contained one per cent La; 0.4 per cent Ce; 0.1 per cent Ca; and 20 ppm Al. All other elements were non-detectable.

The cation concentration column operation performed satisfactorily. The americium waste loss during the loading cycle was 0.04 per cent. The ammonium nitrate wash performed as expected, reducing the acid concentration from 0.12M to 0.03M while giving an americium waste loss of 4×10^{-3} per cent. Four bed volumes of 2.5M ANN eluted 94.6 per cent of the americium from the column.

The anion salt column performed well. The total americium waste loss for the loading cycle was 1.5 per cent. The americium began to break through during the rare earth elution. The first bed volume of 10M LiCl gave an americium loss of 0.1 per cent and the second bed volume gave a loss of 1.6 per cent. Overall decontamination from rare earths of better than 100 was achieved.

The americium performance in the cation crossover column was also excellent. The total loss across the column was 5×10^{-3} per cent.

The anion partitioning column performed as expected. Iron was reduced from 5 mg/l to non-detectable. Plutonium was also non-detectable in the product solution.

e. Resin Studies

A series of tests was carried out to determine the effect of initial moisture content on the ignition temperature of Permutit SK resin.

Nitrate-form resin was washed with distilled water and then portions of the resin were dried to various moisture levels. The ignition temperatures of the dried samples were determined in the standard manner. Two types of drying procedures were used: (1) the samples were heated in the drying oven at 100 C for varying periods of time, and (2) the samples were dried at 40 - 50 C under vacuum. The results showed that drying at elevated temperatures (≈ 100 C) actually causes an increase in the ignition temperature of up to 20 degrees C, whereas low temperature drying lowers the ignition temperature up to 7 degrees C. These results confirm previous tests carried out using resin which had been washed with 8 N nitric acid.

A. L. Frank

Manager
Research and Engineering

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>7-26-64</u>	<u>8-30-64</u>	<u>7-26-64</u>	<u>8-30-64</u>	<u>7-26-64</u>	<u>8-30-64</u>
General Manager's Group	9	9	1	1	10	10
Financial	14	16	20	28	34	44
Employee Relations	3	3	1	1	4	4
Research & Engineering	70	68	27	27	97	95
Facilities Engineering	99	100	214	214	313	314
Production	5	6	3	3	8	9
Redox	62	60	226	224	288	284
Purex	73	72	265	271	338	343
Weapons Manufacturing	<u>61</u>	<u>62</u>	<u>265</u>	<u>267</u>	<u>326</u>	<u>329</u>
Total	<u>396</u>	<u>396</u>	<u>1022</u>	<u>1036</u>	<u>1418</u>	<u>1432</u>

B. PERSONNEL CHANGES

Effective August 1, 1964, M. K. Harmon was transferred from Manager - Redox Operation to Acting Manager - Production Operation.

C. TRIPS

<u>Visitor</u>	<u>To</u>	<u>Nature of Discussion</u>
<u>To AEC and Other AEC Contractors</u>		
W. S. Frank	E. I. du Pont de Nemours Augusta, Georgia	Discussion exchange operations, centrifugal contactor and U-233 programs. (8/4-5/64)
W. P. McCue	Dow Chemical Co. Rocky Flats Plant Denver, Colorado	Classification conference. (8/18/64)
D. McDonald	Albuquerque Operations Albuquerque, New Mexico	Plutonium scheduling. (8/24/64)
<u>To General Industry</u>		
H. D. Haberman	Pacific Steel Products Seattle, Washington	Waste Packaging. (8/10/64)
P. S. Kingsley	Northwest Copper Co., Portland, Oregon	Equipment Fabrication. (8/18/64)
<u>To Conventions and General Meetings</u>		
R. E. Tomlinson	Third International Conference on the Peaceful Uses of Atomic Energy Geneva, Switzerland	Present paper on "Large Scale Fission Product Recovery." (8/31-9/9/64)

D. VISITORS

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From AEC and Other AEC Contractors</u>		
E. M. Shank	Oak Ridge National Lab. Oak Ridge, Tennessee	Separations processes and waste management. (8/4/64)
Ed Miller	US Atomic Energy Commission Washington, D.C.	Waste Management. (8/6/64)
E. E. Strom A. J. Denilauler	Dow Chemical Co. Rocky Flats Division Denver, Colorado	Fabrication of ceramic stirrers and procurement of electro refining cells. (7/31/64)

D. VISITORS (Continued)

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From AEC and Other AEC Contractors (Continued)</u>		
A. Williams G. Molen	Ditto above	Ditto above. (8/4/64)
D. R. Walmsley	Lawrence Radiation Lab. Livermore, Calif.	Quality Audit program. (8/18-19/64)
D. Hauptman W. Miller	Albuquerque Operations Albuquerque, New Mexico	Ditto above
R. G. Chapman P. A. Compton M. Fox R. Musser	Hughes Aircraft Co. Fullerton, Calif.	Arms Control and Dis- armament Agency. (8/27/64)
<u>From General Industry</u>		
J. Gates	Battelle Memorial Institute Columbus, Ohio	Waste Management and Fission Product Processing. (8/13/64)
W. A. Oldham	Nuclear Fuels Services Inc. (Grace Davison Chemical Co.) West Valley, New York	Purex tank farm, 233-S incident. Processing low enriched uranium fuels. (8/26-27/64)
W. Boddie	Dow Chemical Co. Midland, Michigan	Plant orientation. (8/28/64)

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IV. SAFETY AND SECURITY

<u>Operation</u>	<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.</u> <u>Rel.</u>	<u>Total</u>	<u>YTD</u>
Dis. Injuries										0	0
Ser. Accidents		1		1						2	4
Med. Treat. Inj.		11	7	11	7	2				38	332
Rad. Occurrences		1	1		3					5	81
Contam. Wds.										0	13
New Deposition Cases										0	13
Fires				*2						2	9
Security Violations				1		2		1		4	19

* Fire 64-8, August 4. Sparks from the 200 Area burning pit ignited grass and brush.
Damage \$10.00

Fire 64-9, August 11. Sparks from the 200 West burning pit ignited old steam poles,
which were being stored nearby for excess. Damage \$10.00.

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V. REPORTS

A. PREPARED AND ISSUED

- HW-79219 REV, Unclassified, "Product Specifications - Hanford Uranium Trioxide (from Depleted E-Metal) for Off-Site Shipment", dated July 6, 1964, by R. J. Sloat.
- HW-80903 REV, Unclassified, "Critical Mass Control Specification - Transfer of Plutonium-Bearing Materials in the 236-Z Building", dated August 31, 1964, by R. J. Sloat.
- HW-82285, Unclassified, "Product Specifications - Uranium Trioxide (Depleted) for On-Site Storage", dated July 6, 1964, by R. J. Sloat.
- HW-82294 L5, Secret, "Button Purity Data - Letter No. 5", dated August 10, 1964, by R. J. Sloat.
- HW-82294 L6, Secret, "Button Purity Data - Letter No. 6", dated August 21, 1964, by R. J. Sloat.
- HW-82325, Unclassified, "Purex Test Program - Mechanization of Purex Process Data-Automatic Data Processing Equipment, Feasibility Study No. 6350", dated June 1, 1964, by H. M. Jones.
- HW-82660 REV, "Chemical Processing Department, Revision to FY-1962 PA&C Budget, Fission Product Recovery - Phase II", dated July 24, 1964, by L. L. Zahn. (Official Use Only)
- HW-83218, Unclassified, "First In-Tank Waste Solidification Unit Information Manual", dated August 1, 1964, by J. J. Shefcik.
- HW-83220, Secret AWD, "A-Line Quarterly Summary Report, Second Quarter, Calendar Year 1964", dated July 28, 1964, by A. E. Smith.
- HW-83221, Secret AWD, "C-Line Quarterly Summary Report, Second Quarter, Calendar Year 1964", dated July 28, 1964, by A. E. Smith.
- HW-83223 REV, Unclassified, "Critical Mass Control Specification - Plutonium Skull Dissolution, 236-Z Building", dated August 24, 1964, by R. J. Sloat.
- HW-83340, Official Use Only, "Project Proposal, Rev. 3, Fission Product Packaging Facility - B Plant (Project CAC-981)", dated July 29, 1964, by L. W. Finch.

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- HW-83348, Secret, "Technetium Recovery and Storage at B-Plant", dated July 20, 1964, by S. J. Beardi and H. L. Caudill.
- HW-83349, Secret, "Analysis of Chemical Costs for Waste Management Flow Schemes and Fission Product Purification", dated August 10, 1964, by G. L. Ritter.
- HW-83365, Secret, "Redox Solvent Extraction Control System Calibration Manual", dated July 21, 1964, by R. A. Watrous.
- HW-83369 RD, Secret, "Purex, Redox, UO₂ Production Schedules - August, 1964", dated August 1, 1964, by D. McDonald.
- HW-83370 RD, Secret, "234-5 Production Schedule - August, 1964", dated August 1, 1964, by D. McDonald.
- HW-83385, Official Use Only, "Preliminary Project Proposal, Purex Analytical Laboratory Additions (Project CAC-152)", dated August 7, 1964, by C. A. Lyness.
- HW-83406, Secret AWD, "Evaluation of Internal Rounding Ring Fixture for Sheffield Gages", dated July 30, 1964, by J. F. Berggren.
- HW-83436, Unclassified, "Portable Critical Incident Alarm Operation and Maintenance Manual", dated July 27, 1964, by R. G. Oliver.
- HW-83473, Secret AWD, "Weapons Process Engineering Technology Report - July 1964", dated July 30, 1964, by members of the Weapons Process Engineering Operation, Research and Engineering.
- HW-83521, Secret, "Analyses of Brandy Batches Purex No. 18 and 15", dated August 3, 1964, by J. H. Warren.
- HW-83563, Official Use Only, "The Consequences of Accidental Release of Americium Oxide During Shipment to Oak Ridge, Tennessee", dated August 20, 1964, by E. C. Watson.
- HW-83564 REV, Unclassified, "Operating Limits for Hoods 1 and 2 - CAC-330 Miscellaneous Treatment", dated August 25, 1964, by R. J. Sloat.
- HW-83572, Unclassified, "Required Equipment Modifications at Redox for Dissolving PRTR Mixed Oxides Fuels", dated August 6, 1964, by D. F. Davis and O. D. Erlandsen.
- HW-83584, Unclassified, "Nuclear Materials Measurements Reliability Program - Weapons Manufacturing Operation", dated August 7, 1964, by W. J. Gartin.
- HW-83585, Secret AWD, "Effect of Lard Oil on Plutonium Hydriding", dated July 22, 1964, by A. E. Barber.

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- HW-83592, Unclassified, "Operating Instructions, Pressure Instrument for Fission Product Shipping Casks", dated August 10, 1964, by M. T. Slind.
- HW-83594 RD, Secret, "Preliminary Product Specifications and Sample schedules for Purex Thorium Process Test", dated August 7, 1964, by D. F. Davis, J. B. Kendall, G. A. Nicholson and S. M. Nielson.
- HW-83621, Unclassified, "Critical Mass Control Specification - Removal of Solids from 06 Dissolver - 236-Z Building", dated August 11, 1964, by R. J. Sloat.
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- HW-83731, Secret AWD, "A-Line Product Characteristics - July 1964", dated August 19, 1964, by A. E. Smith.
- HW-83759, Confidential, "Scheduled Shutdown - Incinerator", dated August 21, 1964, by M. K. Harmon.
- HW-83762, Secret, "Purex Month End Work Sheets Beginning January, 1961", dated August 24, 1964, by F. G. Kinble. (Continuous Pagn.)
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- HW-83865. Secret, "Analyses of Brandy Batch Purex No. 19", dated August 31, 1964, by M. K. Harmon.

B. PREPARED FOR SIGNATURE AND ISSUANCE

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

AUGUST, 1964

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

W. J. Gaston
for
General Manager
Chemical Processing Department

DECLASSIFIED

END

**DATE
FILMED**

4 / 19 / 93