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JULY, 1963

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OPERATION MANAGERS

August 22, 1968

HANFORD ATOMIC PRODUCTS OPERATION
RICHLAND, WASHINGTON

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

JULY, 1963

I. SUMMARY

Production through July, as compared with the July 25, 1963 EAPC Production Forecast (EW-78187), is summarized below:

	<u>Percent of Forecast Achieved</u>	
	<u>July</u>	<u>Fiscal Year To Date</u>
Separated plutonium nitrate	97.4	97.4
Separated uranium nitrate	96.5	96.5
Uranium oxide	100.1	100.1
Plutonium metal buttons	103.7	103.7
Fabricated parts	113.3	113.3

Overall, production for July was light because of the planned outages of the Purex and Uranium Oxide plants. The Redox plant fell slightly short of forecasted production due to the scheduled outage for process equipment flushing extending longer than expected.

The Purex plant was shut down as planned throughout July due to lack of feed and to complete extensive maintenance work. Equipment replacements made included the sieve plate cartridges in three pulse columns, a condenser on an acid fractionator, two pumps and a tube bundle in a concentrator. Repair of miscellaneous failed equipment, including two tube bundles, was completed.

The EAPC-II-2 cask was loaded with approximately 150,000 curies of strontium-90 and released to the Commission for shipment on July 18. In addition, the EAPC-II-1 cask was loaded with approximately 140,000 curies of strontium-90 and four STT casks were loaded with approximately 210,000 curies of cesium-137, but were not shipped.

The third and fourth neptunium purification runs, which included a batch from Redox, were successfully processed through the Purex purification unit.

Start-up work completed in B-Plant included equipment calibration and run-in, attainment of adequate vessel vent vacuum, completion of canyon ventilation tests and an acid flush run. The "hot" feed route between the CR vault and B-Plant was established.

The Redox plant continued on a seven-day-per-week operating schedule through July 28, when it reverted to the five-day-per-week operating

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schedule. The 57 percent nitric acid flush of the process equipment, required for physical inventory and nuclear criticality control, plus restoration of the D-14 backcycle concentrator were completed during the first part of July. A total of 772 grams of neptunium was shipped to the Purex plant for purification.

The first shipment of "EAPO certified" Model 1807 assemblies was made on July 22.

A prototype, integrated control system was installed at the Redox plant solvent extraction panel. To date, the third uranium cycle has been tied in to the control system for testing.

The annual vacation and maintenance shutdown of the Uranium Oxide plant was taken the first three weeks of July; and all scheduled maintenance, including repair of L-calciner, was completed.

The construction contract for Project CAC-945, "New Waste Storage Tanks, Purex," was awarded on July 20 to Rasmussen, B-E-C-K, Bay Company for the low bid of \$1,718,000.

The Letter of Intent (L-18) covering expenditures of \$210,000 for prototype and mock-up waste management equipment was approved by the Commission.

Greater than 98 percent of the cesium was removed from Purex high-level acid waste in a plant scale test in which phosphotungstic acid was employed to precipitate the cesium.

for J. I. Warren
General Manager,
Chemical Processing Department

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

JULY 1963

II. ACHIEVEMENTS

A. PRODUCTION OPERATION

<u>1. Production Statistics</u>	<u>July</u>	<u>Fiscal Year to Date</u>
a. <u>Percent of Forecast⁽¹⁾ Achieved</u>		
Separated plutonium nitrate	97.4	97.4
Separated uranium nitrate	96.5	96.5
Uranium oxide	100.1	100.1
Plutonium metal buttons	103.7	103.7
Fabricated parts	113.3	113.3
b. <u>Purex</u>		
	<u>July</u>	<u>June</u>
Uranium nitrate produced (tons)	12.28	773.90
Average production rate during operation (T/D)	0	26.2
Total waste loss (%)		
Plutonium	4.19	0.33
Uranium	3.27	0.22
On-line efficiency (%)	0	98.43
c. <u>Redox</u>		
Uranium nitrate produced (tons)	132.40	131.22
Average production rate during operation (T/D)	7.0	6.9
Total waste loss (%)		
Plutonium	0.37	0.34
Uranium	0.23	0.24
On-line efficiency (%)	61	64
d. <u>Uranium Reduction (tons)</u>		
Normal UO ₂ loaded	246	667
Enriched UO ₃ loaded	61	115
Normal UO ₃ approved for shipment	199.99	593.00
Enriched UO ₃ approved for shipment	50.55	100.10
Normal UO ₃ shipped	347.09	494.03
Enriched UO ₃ shipped	50.10	100.33
Normal UNH backlog	186	420
Enriched UNH backlog	102	31

(1) HW-78187, HAP0 PRODUCTION FORECAST, dated 7/25/63

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e. Plutonium Metal Processing

	<u>July</u>	<u>June</u>
Reduction yield (%)	98.04	98.42
Product recovery output (Kgs)	74	76
Product recovery backlog (Kgs)	1268	1216
Waste disposal (grams)	326	326

f. Power

	<u>200-East</u>	<u>200-West</u>
Raw water pumped (GPM)	9,361	4,758
Filtered water pumped (GPM)	973	1,149
Maximum steam generated (Lbs./hr.)	140,000	120,000
Average steam generated (Lbs./hr.)	64,000	72,463
Total steam generated (M lbs.)	47,653	53,913
Coal consumed (tons)	2,485	2,812

Overall, production for July was light because of the planned outages of the Purex and Uranium Oxide plants. The Redox plant fell slightly short of forecasted production due to the scheduled outage for process equipment flushing extending longer than expected.

J. I. Warren
Manager, Production

2. FISSION PRODUCT DATA

	PUREX* RECOVERY	244-CR* INVENTORY	B-CANYON* INVENTORY	SEMIWORKS PRODUCTION	PRODUCT INVENTORY	PRODUCT IN CASK SHIPPED	CUSTOMER	REMARKS
Sr-90 (Kilocuries)	-	1350	-	-	1780	610	150	NYO HAPO II-2 Cask 7-18-63
Cs-137 (Kilocuries)						210		
Ce-144 (Kilocuries)								

*Estimated figures based on Cs. calculations.

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

JULY, 1963

II. ACHIEVEMENTS (Continued)

B. PUREX OPERATION

1. Operating Continuity

The Purex plant was shut down the entire month due to lack of feed and for planned maintenance.

2. Processing Operation

Approximately thirty tons of out-of-specification uranium were re-worked through the second uranium cycle to remove an excess of plutonium impurity.

The third and fourth neptunium purification runs, which included a batch shipment from Redox plant, were successfully processed.

The HAPO II-2 cask, loaded with 150,000 curies of Sr-90, was readied for shipment to Martin-Marietta on 7-18-63. The HAPO II-1 cask was loaded with 140,000 curies of Sr-90 on 7-26-63. The HAPO I-B-1 cask, loaded in December with 470,000 curies of Sr-90, is still awaiting AEC approval for shipment.

The four STT casks, loaded with approximately 210,000 curies of Cs-137, are awaiting shipment.

Strontium recovery runs 65 and 66 were completed in Purex Head End and stored in OC3 CR vault for B Plant feed. An R&D run, using phosphotungstic acid for Cesium separation, was completed.

3. Mechanical Experience

Major shutdown items at Purex included:

- a. Replacement of F-5 condenser.
- b. Replacement of H-4 left hand tube bundle.
- c. Replacement of H-2, K-2, K-3 column cartridges.
- d. Replacement of H-1 and J-3 pumps.
- e. Regasketing of A-3 dissolver chute.
- f. Regeneration of B-2 silver reactor.
- g. Burial of two failed tube bundles and miscellaneous failed equipment.

B Plant startup preparations were completed, including: equipment calibration and run-in; attainment of adequate vessel vent vacuum;

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canyon ventilation tests; and an acid flush run. The hot feed route between 003 CR and B Plant was checked out.

4. Radiation Experience

The total iodine 131 emission for the month was 0.09 curies. Maximum seven-day emission was 0.05 curies.

PR Mc Murray

Manager-Purex

PR McMurray:JDMcI:gt

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

JULY, 1963

II. ACHIEVEMENTS (Continued)

C. REDOX OPERATION

1. Operating Continuity

The Redox plant continued on the seven-day-per-week operating schedule through July 28, 1963, when it reverted to the five-day-per-week operating schedule. Ninety percent of the production schedule was achieved while operating 61 percent of the time available. Also, the 57 percent nitric acid flush of the process equipment, required for physical inventory and nuclear criticality control, plus the restoration of the D-14 backcycle concentrator, were completed during the first part of July.

The production and shipment of both depleted and enriched UO_3 were satisfactory. The annual vacation and maintenance shutdown was taken the first three weeks of July and all scheduled work was completed, including repair of L-calciner.

2. Processing Operations

a. Redox Processing

A total of 772 grams of neptunium was shipped to the Purex plant this month. The balance of the out-of-specification plutonium being held in storage (approximately 10 kilograms high in bismuth content) was returned to the process stream and successfully re-worked.

A prototype integrated control system was installed at the solvent extraction operating panel in the 202-S Building. The system is designed for centralized rate control and automatic rate adjustments to maintain constant liquid levels in the intermediate feed tanks. It will also maintain constant plutonium concentration in the partition cycle plutonium product stream, and a constant ratio of organic-to-aqueous solutions in the precycle columns. Only the third uranium cycle has been tied in to the control system thus far.

The Redox Processing Operation manpower was reduced by two chemical operators during the month; they were transferred to other CPD facilities and were not replaced.

Unit costs will run slightly higher than expected for July because of the eleven-day shutdown period for the acid flush and in-cell equipment maintenance.

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3. Mechanical Experience

a. Redox Plant

The D-14 backcycle concentrator was restored to service by installing in the cooler chest an insert equipped with a cooling coil designed to accommodate a pump in the center of the adapter flange. The backcycle solution is thus pumped from the D-14 vessel rather than from the offset "boot". This boot contains the pump which failed in June and which could not be removed.

The partition cycle feed tank agitator failed after eleven years of service, apparently from electrical trouble. A new agitator was installed on 7-4-63.

The ion exchange feed pump in the 233-S Building failed after only two weeks of operation. This and the previous unit were decontaminated and dismantled; inspection showed evidence of extreme bearing wear and overheating. Although it has not been determined how this happened, it appears that the units were operated without liquid, which is essential for bearing lubrication. A study of the problem, including a review of operating procedures is underway.

Detail design on the Panel Board Consolidation is progressing to the point where installation can proceed as scheduled on August 12, 1963. The CPFF contractor is completing estimates for the piping and electrical portions of the panel board assembly for procured instrumentation.

b. Uranium Oxide

The failure of a shear-pin guard in L-calciner caused subsequent mechanical failure of the agitator blade assembly. The calciner was repaired and returned to satisfactory performance.

The ED-6 enriched metal feed concentrator was replaced with a spare during the July shutdown because of leaking flange assemblies. The failed unit is being repaired and will be held as a "hot" spare.

4. Waste Handling and Decontamination Operation

Equipment valued at approximately \$72,000 was received from customers for decontamination, repair, inspection or burial during the month. Equipment valued at approximately \$81,000 was returned to customers, representing a savings of approximately \$64,000 over the cost of new equipment.

5. Radiation Experience

Due to increasing radiation levels in the ion-exchange unit and the adverse effect on contact maintenance, new specifications for product transferred to the 233-S Building have been established. The specifications may be varied, however, depending upon future experience with activity levels in the ion-exchange contactor.

6. Analytical Experience

The Analytical Laboratory provided customer assistance by determinations for: aluminum nitrate and sodium nitrate in Redox process streams before DIBAN (dibasic aluminum nitrate) is used in the system; the effect of temperature change on pH measurement during water treatment; bismuth as a contaminant in the product recovery of cerium¹⁴⁴; fluoride to aid in the use of the "Zircoflex" process at the Purex plant.

Analytical methods developed included a spectrophotometric method (an adaptation of the Winkler method) for the determination of dissolved oxygen in the demineralized water at NPR, and a wet chemical method for the determination of titanium in Redox plutonium product.

Improvements this month involved the restyling of three computer programs used by the Laboratory for the calculation of gamma energies and instrument and methods factors. Benefits realized are reduced computer costs and easier means of calculating gamma energies.

AK Harmon

Manager - Redox

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

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II. ACHIEVEMENTS (Continued)

D. WEAPONS MANUFACTURING OPERATION

1. Operating Continuity

Fabrication activity on the Model 1807 returned to normal in July with production and shipments on schedule at month end. Regular production of the new Model 74-C was started during the month. Production requirements were exceeded, but deliveries were held pending approval of the process by the design agency. This approval was received following the last July shipment and the month's production of the new model will be included in the first August shipment. The production of unfabricated plutonium exceeded schedule. Recovery activities were limited to the dissolution of special plutonium scrap preparatory to processing it in the Redox facility. The incinerator remained out of service during the month.

2. Processing Operations

a. Plutonium Fabrication

Information on plutonium fabrication activities is presented in Document HW-78586 (Atomic Weapon Data).

On July 22, a shipment was made containing the first weapons assemblies "certified" under Hanford's new Quality Assurance Program.

b. Plutonium Processing

The production schedule for unfabricated plutonium was achieved but mechanical difficulties with the Hood 9-A button line equipment and the Hood 46 ion exchange unit resulted in a considerable amount of down time. In addition to the regular production, some special plutonium oxide was prepared for use in PFTR fuel elements.

Recovery activities were limited by a shortage of containers and by higher priority needs for the employees who normally operate the reclamation equipment. A significant amount of special plutonium scrap was dissolved in preparation for its further processing at the Redox Plant.

Another 26-inch section of the J-26-A vessel (Recuplex stripper-concentrator) was cut away to permit the removal of the balance of the plutonium compound which still remains in this tank.

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3. Mechanical Performance

Weapon fabrication equipment on both the FMA and FMC Lines functioned satisfactorily during July.

Outages on the 9-A button line equipment resulted from off-gas problems, vacuum system leaks, pump failures and conveyor failures.

The renovation of the 9-B Hood (Shielded Button Line Continuous Unit) continued with the removal of equipment in preparation for the installation of the new modifications.

Acceptance tests were satisfactory on the recently installed Hadley balance in the Final Inspection facility and it is now in service.

The conversion of the 234-5 and 291-Z Buildings nuclear excursion alarms from "siren" to "howler" is in progress.

The breathing air manifolds in the 234-5 and 291-Z Buildings are being modified to conform to HAPO Standards.

Three non-exempt employees (Process Operators) have been assigned to the new reclamation facility (Project CAC-880) to assist engineering and construction personnel in flushing and testing of equipment.

4. Radiation Experience

A case of potential plutonium deposition occurred when an operator received a wood sliver in his finger while using a wooden tamper at the turings briquette press. The wound was excised and the whole body counter indicated that the deposition will be less than two percent of the permissible body burden. Five other cases of possible depositions involved hood pressurization or leakage of bags. Indications in all five cases are that deposition will be in only trace amounts.

5. Analytical Experience

		July	
		<u>Weapons Grade</u>	<u>Unclassified</u>
Number of Samples Received			2,288
Number of Determinations			20,056
Total Impurities, Buttons (average)	2,100		2,810
Buttons Rejected for Impurities	4.9%		11.9%
Pu ²⁴⁰ Content*	5.94%		7.70%-7.97%

*Values of Pu²⁴⁰ were based on neutron counter data for weapon grade material and on mass spectrographic data for unclassified material. In addition, there were eight buttons which did not meet either specification (Pu²⁴⁰ values ranged from 7.125 to 7.689).

W. J. Garton
Manager
Weapons Manufacturing

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

JULY 1963

II. ACHIEVEMENTS (Continued)

E. POWER AND CRAFTS OPERATION

1. Operating Continuity

There were no interruptions to the steam, water or electrical services that affected continuity of operation of GPD production facilities; however, an outage of seven minutes duration occurred July 26 to the export raw-water supply to the 200 Areas. The outage was caused by pump difficulty at the River Pump House.

2. Inspection, Maintenance and Repair

A new tube bundle was made ready for installation in the H-4 concentrator at the Purex facility, as a replacement for a failed unit.

A contaminated environmental hood (EA-30) was removed from its original position and connected to the Weapons Manufacturing Operation's RMA line for use in stabilizing FLO-Turn lathe-work pieces.

Three replacement column cartridges (H-3, K-3 and K-2) were fabricated and made ready for installation during the recent Purex shut-down. The H-3 precycle scrub cartridge and the K-3 uranium stripping cartridge were scheduled replacements. The K-2 uranium decontamination cartridge was assembled on a crash basis when the plastic plates in the in-service unit were found to be in poor condition.

A spare standard pulser was converted to a long-stroke unit as an emergency replacement for the K-3 uranium stripping column pulser which failed at the Purex facility. The work involved complete disassembly, machining new parts, alteration to key parts and re-assembly. The unit was run-in for 72 hours before delivery.

The conveyor in C4-2E gauging hood in the Weapons Manufacturing Operation's inspection line was reworked. This is a new conveyor which was fabricated off-site and installed by department craftsmen. Lack of proper tolerances necessitated the disassembly of the unit and the machining of contaminated parts in a hood at the 231-Z facility.

A steam coil was fabricated and installed in the E-2H chemical make-up tank at the Purex facility, to provide warm chemical solutions for the process.

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Twenty-two cell pipe jumpers were fabricated for the production plants. Purex required 13, Redox 8 and F-Plant one.

The walls of room #58 in the Purex Laboratory were relocated to provide additional space for use as an analytical lab. The room was previously used as a storage for radioactive materials.

As a preventive maintenance measure, the original wooden steps to the docks and entrances to 275-EA, 274-W and 275-W Buildings were replaced with precast concrete steps. Steel handrails for these locations were in the process of fabrication at month's end.

No. 4 boiler in the 284-E Power House received a third-party inspection during the month, and was found to be satisfactory for continued operation.

No. 3 pump in the 282-E Pump House was removed from the emergency electrical system, to assure that adequate emergency capacity would be available for priority equipment at Purex to automatically switch over during an outage of the primary electrical system.

Personnel from the Power and Crafts Operation's air-balance group conducted smoke tests on high-efficiency filter banks in the Irradiation Processing Department's 105-B and F Buildings.

Manager
Power and Crafts Operation

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

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II. ACHIEVEMENTS (continued)

F. FACILITIES ENGINEERING OPERATION

1. Purex

a. Process Design Engineering

Purex Dissolver Study

Additional considerations in the Purex dissolver design study have been focused on methods of charging and on the feasible, known methods of dissolving "E" Metal and NPR fuels. Tentative conclusions are:

- (1) Continuous or semi-continuous charging is not economically feasible;
- (2) NPF-type dissolvers are not adequate for high rate charging and dissolution;
- (3) sandwich-type dissolvers are difficult to charge evenly; and
- (4) annular-type dissolvers appear most promising on the basis of demonstrated high charging rates and high dissolution rates.

Apparently, the dissolver with a 12-inch wide annulus is the preferred size because it allows use of a removable insert for processing higher enriched fuel. Preliminary results indicate that the 12-inch annular dissolvers are capable of dissolving 0.94 "E" Metal at a 4.0 capacity factor rate, together with capability of dissolving all the NPR fuel required.

Titanium Tube Bundles

The Purex titanium tube bundle which had previously been removed from the F-6 Concentrator (acid service) and put into the F-11 Concentrator (waste service) was visually inspected and color photographs were taken by remote means. A white scale was observed on the titanium tubes and dished head. This scale is being analyzed as part of the additional investigation.

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b. Project Engineering

CAC-945 - New Waste Storage Tanks - Purex

Bids for construction of the new Purex Tank Farm were opened on July 16. The low bidder of ten was Rasmussen, B-E-C-K, Bay Company, at \$1,718,000. The fair cost estimate was \$2,072,000. The allowance in the project proposal was \$1,950,000. Contract No. AT(45-1)1699 was awarded on July 24. Work is to be completed by September 26, 1964.

CGC-965, Rev. #2 - In-tank Waste Solidification-200-W Area

This project proposal revision, requesting total project funds in the amount of \$590,000, was submitted to the Commission on July 29. Major reductions were deletion of work on Tank BY-102, and simplification of instrumentation and controls.

Waste Management Packaging Equipment

Letter of Intent (LI-18), covering expenditures of \$210,000 for prototype and mock-up waste management packaging equipment was approved by the Commission. The stipulations were made that the scope document be submitted to RL00 before equipment procurement is initiated and that any capitalized prototype equipment procured therefrom be charged, as transferred capital property, to Project CGC-981.

2. Redox

a. Process Design Engineering

Hexone Recovery

During the month, all in-canyon design was completed. Ten (10) of the twenty (20) jumpers designed have been built. In order to place the Hexone system into operation, it is necessary to route the off-gas from the H-4 oxidizing pot to the H-6 condenser for removal of acidic and water content prior to routing to the H-5 for removal of iodine particles before venting to the air tunnel. This has required that two new jumpers be designed and built, and an existing one revised.

224-U Vessel Vent System

Design has been initiated on a vessel vent system for 224-U Building.

3. Weapons Manufacturing

a. Process Design Engineering

Incinerator Facility

Detail design of the additional leaching facilities and scrubber solution processing facilities is complete. Installations completed during the month were furnace refractory and heating elements, exterior insulation, new cyclone glove box, and an additional four-unit inlet air filter on the ash-canning glove box. A rough draft initial start-up procedure for the furnace has been completed. Work was started toward establishing calibration curves on buildup of plutonium inside the ignition and off-gas chambers.

RMA Fabrication Line

All design scope drawings for the Degreasing and Briquetting Facility were completed and are undergoing engineering review. A rough draft of the design scope document has been prepared. Design scope drawings for the Arc Melting Facility were prepared, revised, and submitted for final approval. The design scope document for this facility is being prepared for final issue.

A project proposal was submitted for additional RMA Line casting facilities. A separate scope document is being prepared to define Company requirements for this facility. All design scope drawings were completed, and a new material balance and engineering flow diagram of the RMA Line processes was prepared.

The finishing and re-work glove box (HA-40F) has "gone hot" and is functioning satisfactorily.

RMC Fabrication Line

The detailed design drawings and Purchase Specifications for the HC-30 Fabrication Oil Storage and Sampling Facility were approved and issued. The glove box is being fabricated by CPD Shops, and the facility is scheduled for completion by January 1, 1964. Design scope drawings for the Floturn Complex (HC-44) are being prepared for transmittal to Vitro for detail design.

Plutonium Reclamation Facility

Mechanical detail design of the skull dissolver glove box

equipment has been completed. A report was prepared to provide supplemental information regarding the scope of work to be performed in the miscellaneous treatment facility.

b. Project Engineering

CGC-912 - Waste Treatment Facility - "Z" Plant

Directive No. HW-522, Mod. #4, was received on July 24. The directive approves the modifications necessary to improve nuclear safety and authorizes the expenditure of an additional \$150,000. Vitro started design modifications on July 25.

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

HA-23-S "A" Line Hood for storage of rough castings and ingots is in full operation using a temporary manlift for access to the upper storage levels. Fabrication of a permanent manlift is 50 percent complete in the J. A. Jones Company Shop.

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

The project is complete, approximately five (5) months ahead of schedule. The balance hood was put into service on July 12.

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

The bid invitations for the 100,000 psi isostatic press and associated equipment have been sent out, and the bid opening is scheduled for August 8.

c. Manufacturing Engineering

Power Rolled Model - Manufacturing Engineering Activities

The IBM-oriented forms for ingotting were utilized on the RMA Line beginning early in the month. After the cards were used for several days, it was decided to provide separate color cards for FDC runs to keep this process information segregated from the process information generated from FDD runs. The color coding was expedited, and the subsequent experience with the forms has been good.

The combination Power Roll and Machining Card is being re-designed to provide more pertinent information, and the mechanics of the system are being improved to provide faster feedback of information to management.

4. General

a. Process Design Engineering

Waste Management Program

Discussions of electron beam welding for closure of shipping packages have led to a proposal from one vendor (Hamilton Standard of Windsor Locks, Connecticut) for a three-phase program at an estimated cost of \$330,000. The potential vendor is now studying the possibility of a working arrangement whereby only the weld joint would be in a vacuum zone. If feasible, this system could be supplied without prohibitive costs. The Electro Glass Laboratories of Beaverton, Oregon, are also studying this possibility and are expected to submit a proposal during August.

Hanford Isotope Plant (HIP)

Capital cost data and descriptive information on inter-ties between various phases of the Waste Management and Fission Product Recovery programs, were prepared for a presentation to the Industrial Participation Task Force headed by B. B. Schwartz of the Commission's Division of Production. Three (3) basic alternates presented for their consideration were as follows:

- (1) Operation of HIP by a private contractor;
- (2) operation of all "B" Plant with either a 2 or 4 product encapsulation annex; and
- (3) operation of the entire waste management program by a private contractor.

Radio Transceivers

Prototype belt-mounted transceivers have been demonstrated to Redox and Purex personnel. Useful applications in radiation zone work were evident in both plants. The transceivers are now being returned to the vendor for modifications to improve their operation.

b. Project Engineering

Project Cost Information - as of 7/21/63:

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HW-78484

Total Authorized Funds -	
14 active projects	\$ 3 571 000
Total Cost-to-date	2 785 000
Commitments and Open Work Releases	213 000
Unencumbered Balance	573 000
Costs Charged to Above Projects	
6/23/63 to 7/21/63	50 000

J. B. Techt
Manager - Facilities Engineering

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

JULY, 1963

II. ACHIEVEMENTS (Continued)

G. RESEARCH AND ENGINEERING OPERATION

1. Purex Process Engineering

(a) Solvent Extraction

The performance of the Second Uranium Cycle had been gradually deteriorating in terms of 2D Column scrubbing efficiency and capacity. Advantage was taken of the scheduled July shutdown to flush and inspect the 2D Column scrub section cartridge. The polyethylene sieve plates were found to be broken and a substantial quantity of small pieces were flushed from the upper disengagement section of the 2D Column and the organic distributor of the 2E Column. The failed cartridge was replaced with one of similar design, with fluorothene sieve plates. Previous plant experience has shown long service life and good performance with fluorothene sieve plates in the low radiation fields encountered in the Second Uranium Cycle.

(b) Product Treatment

The third and fourth neptunium purification runs were successfully completed in the ion exchange unit. Product quality was good except for zirconium-niobium contamination. In the third run, the zirconium-niobium content exceeded specifications by a factor of two and in the fourth run by a factor of four. The third run was shipped on a waiver while the fourth run was reprocessed.

(c) Water Treatment

One demineralizer anion unit was charged with a new weak base resin, Amberlite XE-225, which is reported to have high resistance to organic fouling and oxidation. The resin will be evaluated during the next run period.

(d) Waste Rework

Plant scale batch extraction studies were conducted to evaluate trilaurylamine (TLA) as an extractant for plutonium and neptunium from Purex high level acid waste (IWW). Trilaurylamine, 0.3 M TLA in Soltrol, was used as the extractant and dilute oxalic acid as the strip. Sixty per cent of the plutonium was recovered in plant tests compared to greater than 90 per cent recovery in laboratory contacts with the same plant solutions. Neptunium concentrations were too low to evaluate.

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(e) Fission Products

B-Plant

Operability testing of B-Plant fission product equipment was nearing completion at month end. The oxalate precipitation step which separates strontium from cerium and the rare earths was discontinued at Purex in anticipation of B-Plant start-up.

A full scale plant test employing phosphotungstic acid to precipitate cesium was made on Purex high level acid waste. The waste was adjusted to 0.003 M phosphotungstic acid and the precipitated cesium separated by centrifugation at 1500 G's. The precipitate was dissolved in dilute sodium hydroxide. Greater than 98 per cent of the cesium was removed from the waste.

2. Redox Process Engineering

a. Results of Acid Flush

The fiscal year-end acid flush recovered 912 grams of plutonium from the extraction columns, overflow lines, and associated vessels. 137 grams of plutonium were recovered from the 1A Column and 170 grams were recovered from the 1A overflow line. This is similar to the deposition pattern observed in the November, 1962, and March, 1963, flush.

b. Product Decontamination

The fission product decontamination of both the plutonium and uranium streams was poor during the first part of the month. The loss of decontamination was attributed to sizable volumes of waste rework and to higher than normal internal salt recycle. (As a result of a sizable F-2 concentrator tube bundle leak, a portion of the backcycle salt was lost to the F-Cell floor which necessitated operating with increased salt recycle.)

In order to recover decontamination across the solvent extraction battery, the 1AA scrub stream was increased from a 10 to a 20 flow ratio and the organic extractant flows to the 3D, 1A and HA Columns were reduced as follows:

<u>Column</u>	<u>Stream</u>	<u>% Reduction</u>	<u>L/V Ratio Change</u>
3D	3DX	9.3	0.3 to 0.33
1AX	1AX	8.5	0.41 to 0.44
HA	HAX	15.0	0.52 to 0.64

With the new flowsheet, the decontamination across the precycle and partition cycle has been satisfactory; however, the decontamination factor across the third uranium cycle dropped to an arithmetic 5 from a normal 20 to 40. This loss of decontamination across the 3D Column appears to be a separate problem from that of over-all poor decontamination experienced earlier in the month and is being evaluated. Laboratory tests revealed that the solvent is highly contaminated with nitroso compounds and exhibited DFs about 30 percent lower than fresh hexone; the hexone was being washed with caustic at month-end.

c. Waste Tank Sludge Sampler

A sample of soft sludge was obtained from the 114-SX waste tank using a special self-closing drill bit which was designed and fabricated on-site. The teeth of the core-sample drill bit were made of brass and were designed so that they would fold up to retain the sample when the drill reached the bottom of the waste tank.

Commercial drill bits had been tried but the sludge was so soft that it dribbled out of the drill and sample tube when the drill string was pulled out of the tank. The vendor had been asked to provide a self-closing drill bit but the drill teeth sheared off on contact with the bottom of the waste tank.

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3. Plutonium Process Engineering Operation

a. Button Line

Processing difficulties were noted in the anion exchange unit. Increased pluggage of the ion exchange beds was noted and high waste losses occurred sporadically. Pluggage was caused by the failure of 25-micron ceramic feed filters and 100-micron glass wool replacement filters. These filters have been replaced with a filter combination consisting of 50 - 100-mesh screens coupled with 15 - 20-micron glass wool filters. Apparent high waste losses were caused (in part) by occasional bursts of americium 241. Analytical techniques have been modified to minimize americium effects. In spite of the difficulties, the anion exchange unit recovered 97.7 percent of the plutonium present in the button line supernatants.

b. Z-9 Crib

Core samples taken to a depth of 6 feet in the Z-9 crib (used primarily for Recuplex) have indicated relatively high plutonium concentrations at certain locations in the top 6 inches of the soil. At three of the seven sample locations, plutonium concentrations ranging from 5 to 25 grams per liter of soil were noted (top 6 inches of soil in sample homogenized). On the basis of the recent analyses, it has been estimated that the crib could contain as much as 80 to 100 kgs of plutonium. Consequently, additional use of Z-9 is not considered advisable and alternate crib sites are being investigated.

Studies have been made to determine the handling capacity of previously used Z-1 and Z-2 tile fields. Approximately 75,000 gallons of water have been introduced to these fields at rates as high as 70 gallons/minute. This flow is a factor of 3 higher than the flow scheduled for the Z-9 crib.

Economics studies are being made to determine the feasibility of recovering the plutonium in the Z-9 crib.

c. Dissolution of Burned Alloyed Skulls

Glass dissolvers successfully dissolved burned alloyed skulls. The dissolved solution was sent to Redox for purification. Some solids were found in the solutions as unloaded at Redox. The solids are believed to have resulted from the removal of scale in the PR cans by the greater than 60 percent nitric acid remaining in the solutions after dissolution. Solutions are filtered prior to loading into the PR can and laboratory studies have shown no post-precipitation on standing.

d. Plutonium Reclamation Facility (CAC-880)

A report, HW-78335, "Miscellaneous Scrap Treatment in the Plutonium Reclamation Facility (CAC-880)", was issued during the month. The report includes information concerning the estimated miscellaneous scrap inventory at CAC-880 start-up. It also presents preliminary design criteria and processing rate data for the various types of miscellaneous scrap accumulated.

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4. Separations Chemistry Laboratory

a. Purex Process Improvement

A physical method using a push-pull gauge has been developed to measure the force required to rupture ion exchange resin beads. The procedure is useful in examining the initial quality of purchased resins and in studying radiation effects, time in service effects, and the relationship between bead strength and plutonium ion exchange performance.

The addition of trace quantities of permanganate to the Purex water supply was tested during the week of July 8 with the following tentative conclusions: (1) Uranium transfer rates showed some improvement; (2) analysis of the first set of samples gave a 20% reduction in iron content, reduction of chloride by a factor of 3 (chloride addition was eliminated during the test), and a reduction of silica content by a factor of 4; and (3) the combined inorganic and organic solids content appears to have decreased by a factor of 3. The initial water was of good quality at the time of the test and, since the permanganate was added ahead of the filters, considerable scavenging action by the MnO_2 was available.

b. Redox Process Improvement

(1) Addition of Diban to the 3D Column (Uranium Purification)

Laboratory studies have been completed concerning the direct addition of diban (dibasic aluminum nitrate) to the Redox 3D (uranium purification) column. Acid deficiency in the 3D column is achieved by the addition of diban to the scrub section of the column. Such an addition results in the following desirable conditions: (1) It is not necessary to adjust the 3DF (feed) to acid deficiency with sodium hydroxide which results in sodium nitrate formation. Sodium nitrate is detrimental in that back-cycle concentrations are limited by its presence. (2) Higher acid deficiency may be achieved in the scrub section of the column which results in better decontamination from fission products. Multiple batch counter current runs in the laboratory, using dissolver solution spike have yielded an arithmetic ruthenium decontamination factor of 300, a zirconium-niobium factor of 4800, and decontamination from Cs and Ce beyond the detection limits.

c. Fission Product Process Improvement

The choice of sodium bismuthate as the oxidant for Ce(III) in the recovery process produces a rare earth fraction contaminated with bismuth. Laboratory tests indicate that separation of the rare earths from Bi(III) can be accomplished using DTPA as complexant and adjusting the nitric molarity to about 0.2M.

Bismuth was also separated in the laboratory from a synthetic nitric acid solution of rare earths (La spiked with Ce-144) by precipitating

the bismuth with caustic after buffering with formic acid. Ninety eight to ninety nine per cent of the bismuth was precipitated with up to 4% of the cerium being lost by scavenging to the precipitate.

Studies on the recovery efficiencies of technetium on a strong base anion resin have shown that nitrite ion interferes seriously with the process. Recovery of only 27% at 5M were experienced as compared to 94% recovery when nitrite has been reduced to 0.5M by water dilution of the feed solution. Hydrazine, hydroxylamine sulfate, and sulfamic acid will all reduce the nitrite concentration but in each case subsequent adjustment of pH and technetium valence are required.

d. Laboratory Improvement

Determination of the uranium content of Purex metal solution composite samples by using U^{233} in an isotopic dilution method has been carried on since December with the following comparisons available to date.

<u>Month</u>	<u>AT/U RATIO*</u>		<u>% Difference</u>
	<u>Purex</u>	<u>Isotopic</u>	
Dec.	2.21	2.22	+ 0.5
Feb.	2.70	2.69	- 0.4
March	2.34	2.33	- 0.4
May	2.28	2.35	+ 3.1

* Multiplication factors omitted.

The May isotopic value correlates better with plant experience, hence the data for the four months indicates the reliability of the method to be high and the program will therefore be continued.

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5. Plutonium Chemistry Laboratorya. Electrowinning Of Plutonium Metal

Equipment changes for increasing capacity are under way.

In an attempt to reduce the cell resistance so that more current can be passed through it without overheat, a heavy-walled anode and cathode have been fabricated. In addition, a new type off-gas filter that should allow more trouble-free operation has been designed and procured. A continuously-variable speed motor has been installed on the PuCl_3 feed drive mechanism. This will provide continuous, rather than intermittent, feed.

Design of new equipment for a four-inch cell is complete.

b. Analysis For Plutonium In Fused Salts

A method of in-process analysis of plutonium in the electrolyte using the anode effect phenomenon is being developed.

This involves using a small auxiliary anode, the cell cathode, and a separate D.C. source. The amperage at which the anode effect occurs is a function of the percent plutonium. The range from 0 - 14 percent Pu has been investigated and the results are very promising for the electrorefining process. More work is needed to determine the value of the method for the concentration range of the electrowinning process.

c. Americium Recovery

A flow sheet is being prepared.

Studies are being made on the extraction and purification of Am^{241} from stored scrap at the startup of the Reclamation Facility. Laboratory efforts are currently devoted to isolation of small quantities for development work. Details for a plant flow sheet are being worked out, based on data and experience elsewhere.

for Manager
Research and Engineering

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

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II. ACHIEVEMENTS (Continued)

H. FINANCIAL OPERATION

1. Production Cost Accounting

The First Allocation of Funds (based on AEC Financial Plan No. 1 for FY 1964) was received and corresponds closely to budget request except in the case of Isotope Inventory. The Division of Isotopes Development specified a balance of \$1,373,000 at June 30, 1964 for this inventory. The budget request was for \$1,926,000 (submitted at \$1,985,000 by local AEC). A minimum balance of \$1,900,000 is required, assuming shipment of the long-held HAPO 1B Cask; \$2,300,000 if the cask remains unshipped. Balance at June 30, 1963 was \$1,662,000.

Special requests handled during the month included:

- 2 Kg Pu Metal for Monsanto
- 5 Kg Pu Metal for NUMEC
- 30 Kg Pu Metal for duPont (Savannah River)
- 200 Gr Pu Nitrate for Oak Ridge

Procedures for Redox and Purex Brandy costing were reviewed and copies issued for transmittal to Washington AEC.

Financial data was developed for the study of historical and forecasted waste management costs requested by NUMEC (document HW-78149).

Historical and budget data on Fission Products costs were provided Purex for the AEC sponsored local discussions on industrial participation.

CPD's investment in inventories at June 30, 1963 compared with budgeted amounts is as follows:

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(in thousands)	<u>Balance 6-30-63</u>	<u>Control Allocation</u>	<u>Surplus (Deficit)</u>
<u>Inventories</u>			
Essential Materials	\$ 820	\$ 825	\$ 5
Spare Parts & Standby	1 661	1 600	(61)
Special Materials	78	103	25
Yttrium	<u>153</u>	<u>153</u>	<u>-0-</u>
Gross Inventories	<u>2 712</u>	<u>2 681</u>	<u>(31)</u>
<u>Reserves</u>			
Essential Materials	42	58	(16)
Spare Parts & Standby	567	481	86
Yttrium	<u>153</u>	<u>153</u>	<u>-0-</u>
Total Reserves	<u>762</u>	<u>692</u>	<u>70</u>
<u>Net Investment</u>	<u>\$1 950</u>	<u>\$1 989</u>	<u>\$ 39</u>

2. Personnel Accounting

The annual Salary Administration Report was completed and forwarded to the HAPO General Manager in July.

3. General Accounting

As of June 30, 1963, fourteen active projects had incurred costs of \$2,791,037 against authorized funds of \$3,554,600. Outstanding commitments totaled \$176,541.

Fourteen appropriation requests totaling \$657,745 were approved during the month. The appropriation request for NPR Casks and Cask Cars accounted for \$540,000 of this total. Also included in the total were seven appropriation requests totaling \$74,600 programmed for FY 1963 but on which procurement action was not started during the year. Due to the change in appropriation practices, these appropriation requests must now be financed from FY 1964 funds.

Manager - Finance

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>6-30-63</u>	<u>7-28-63</u>	<u>6-30-63</u>	<u>7-28-63</u>	<u>6-30-63</u>	<u>7-28-63</u>
General Manager's Group	11	11	2	2	13	13
Financial	14	14	15	15	29	29
Research & Engineering	63	63	30	31	93	94
Facilities Engineering	64	71	26	25	90	97
Power & Crafts Operation	38	38	237	236	275	274
Production	6	6	4	4	10	10
Redox	58	59	232	231	290	290
Purex	70	70	266	261	336	331
Weapons Manufacturing	<u>50</u>	<u>50</u>	<u>212</u>	<u>211</u>	<u>272</u>	<u>272</u>
Total	<u>374</u>	<u>382</u>	<u>1 034</u>	<u>1 027</u>	<u>1 408</u>	<u>1 410</u>

B. PERSONNEL CHANGES

E. M. Johnston, formerly with Hartford Utilities and Purchasing Operation, transferred to Facilities Engineering Operation as a Consulting Engineer - Process Design, effective July 1.

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C. TRIPS

<u>Visitor</u>	<u>To</u>	<u>Nature of Discussion</u>
<u>To AEC and Other AEC Contractors</u>		
R. E. Smith	New York AEC Oper. Office New York, New York	Attend pre-proposal Bidders Conference. (7/9-10/63)
D. D. Wodrich	Dow Chemical Company Rocky Flats Plant Denver, Colorado	Design criteria for metrology laboratory. (7/9/63)
W. J. Gartin	AEC Operations Office Albuquerque, New Mexico	Attend Program Review Meeting. (7/10/63)
R. J. Dal Ponte R. B. Hershey	Dow Chemical Company Rocky Flats Plant Denver, Colorado	Attend Non-Destructive Testing Meeting. (7/16-17/63)
H. C. Rathvon	Mound Laboratory Monsanto Research Corp. Miamisburg, Ohio	Chemical processing of polonium. (7/19/63)
D. D. Wodrich	Sandia Corporation Albuquerque, New Mexico	Design criteria for metrology laboratory. (7/19/63)
D. E. Braden	Dow Chemical Company Rocky Flats Plant Denver, Colorado	Americium recovery processing. (7/19-20/63)
	Union Carbide Company Oak Ridge, Tennessee	Ditto above. (7/21-22/63)
M. H. Curtis M. J. Szulinski	Dow Chemical Company Rocky Flats Plant Denver, Colorado	Discuss americium recovery. (7/22-23/63)
D. E. Braden	du Pont Company Savannah River, S.C.	Americium recovery processing. (7/23/63)
A. E. Smith R. E. Van der Cook	Los Alamos Scientific Lab. Los Alamos, New Mexico	A-Line process discussions. (7/23/63)
A. E. Smith	Lawrence Radiation Laboratory Livermore, California	Discuss Project Whitney. (7/24/63)

C. TRIPS (Continued)

<u>Visitor</u>	<u>To</u>	<u>Nature of Discussion</u>
<u>To AEC and Other AEC Contractors (Continued)</u>		
M. H. Curtis	Oak Ridge National Lab.	Discuss transuranium processing.
M. J. Szulinski	Oak Ridge, Tennessee	(7/24-25/63)
	E. I. du Pont	Discuss americium separations.
	Savannah River Plant	(7/26/63)
	Aiken, South Carolina	
<u>To General Industry</u>		
L. B. Bradley	Electro-Glass Labs	Electron beam welding apparatus.
J. F. Kane	Beaverton, Oregon	(7/10/63)
P. S. Kingsley		
J. W. Kolb		
R. W. Gooldy	Browne & Sharpe Co.	Inspect and test new machine tool.
	Providence, R. I.	(7/20-25/63)
<u>To Conventions and General Meetings</u>		
M. L. Madeen	Longview, Washington	Give talk on fission products before SW Section of AIChE.
		(7/23/63)
<u>Other Federal and State Agencies</u>		
W. R. Kendall	U. S. Bureau of Mines	Arc melting equipment.
	Albany, Oregon	(7/3/63)

D. VISITORS

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From Other G. E. Components</u>		
David Cochran	Evandale, Ohio	Discussions concerning applications for nuclear devices in space.
		(7/16/63)

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D. VISITORS (Continued)

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From AEC and Other AEC Contractors</u>		
C. Barrett J. Sullivan	Dow Chemical Company Rocky Flats Plant Denver, Colorado	Discuss quality control. (7/1-2/63)
W. Stetson	Lawrence Radiation Lab. Livermore, California	The Coach Project. (7/5/63)
H. S. Green L. W. Grote	Dow Chemical Company Rocky Flats Plant Denver, Colorado	Machining and inspection consultation. (7/10/63)
A. Berman Div. of Isotopes Dev.	U.S. Atomic Energy Commission Washington, D.C.	Fission products processing and tour Semi-works facilities. (7/23-24/63)
A. H. Ewing Div. of Contracts	U.S. Atomic Energy Commission Washington, D.C.	Waste management; fission product recovery. (7/24-25/63)
E. E. Fowler Div. of Isotopes Dev.		
J. S. Kratz Div. of Reactor Dev.		Ditto Above.
J. H. Rubin Div. of Industrial Participation		Ditto Above.
B. Schwartz Div. of Production		Ditto Above.
C. Singleton	Lawrence Radiation Lab. Livermore, California	Process consultation. (7/25-26/63)
<u>From General Industry</u>		
C. Luft	DuBois Chemical Company Walla Walla, Washington	Decontamination chemicals. (7/1/63)
S. Miller	DuBois Chemical Company Cincinnati, Ohio	Ditto Above.
C. Harrington W. Roche	United Nuclear Corporation St. Louis, Missouri	Waste management; fission product recovery; plutonium reclamation. (7/12/63)

D. VISITORS (Continued)

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From General Industry</u> (Continued)		
J. J. Morris	Precision Eng. Co. Seattle, Washington	Consultation on vacu- blasting. (7/23/63)
H. T. Chambliss	Vacu-Blast Co., Inc. Belmont, California	Ditto above.
Robert Brauer	Calif. Metal Enamelling Co. Seattle, Washington	Consultation on sign writing. (7/31/63)

From Other Federal And State Agencies

J. L. Ashe (From Spokane Regional Office)	Federal Mediation and Conciliation Service Washington, D.C.	Discuss CPD work and plant tour. (7/24/63)
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CHEMICAL PROCESSING DEPARTMENT
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IV. SAFETY AND SECURITY

<u>Operation</u>	<u>General</u>	<u>FEO</u>	<u>Finance</u>	<u>WMO</u>	<u>P&CO</u>	<u>Purex</u>	<u>Redox</u>	<u>Prod.</u>	<u>R&E</u>	<u>Total</u>	<u>YTD</u>
										<u>CPD</u>	<u>YTD</u>
Dis. Injuries											5
Ser. Accidents											2
Med. Treat. Inj.				4	8	9	8	1		30	295
Rad. Occur.				6		1	5			12	85
Contam. Wd.				1			1			2	13
Pu Dep.				2*						2	7
Fires				1**						1	5
Sec. Viol.		2								2	11

*One inhalation; one injection - Both less than 1.0% MPBB

**Fire, 63-5, 7/12/63 - contaminated waste carton in waste burial shed behind 234-5
Building ignited spontaneously - Damage: \$10.00

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CHEMICAL PROCESSING DEPARTMENT
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V. REPORTS

A. PREPARED AND ISSUED

- HW-65616 REV, Unclassified, "Critical Mass Control Specification - Waste Hutment", dated July 31, 1963, by R. J. Sloat.
- HW-75100, REV 2, Unclassified, "Critical Mass Control Specification - Dissolving Plutonium Oxide in Room 161 of 234-5 Building", dated July 12, 1963, by R. J. Sloat.
- HW-75380 REV, Unclassified, "Critical Mass Control Specification - Storage of Plutonium Metal in Vault 106", dated July 10, 1963, by R. J. Sloat.
- HW-76931 REV, Unclassified, "Critical Mass Control Specification - Dissolving PuO₂ in Hood 42", dated July 10, 1963, by R. J. Sloat.
- HW-77174, Official Use Only, "Project Proposal, Rev. #2, In-Tank Waste Solidification - 200-East Area - Project CAC-965", dated July 19, 1963, by M. N. Raile.
- HW-77503, Unclassified, "Chemical Processing Department - Hazards Review Task Force Report - Plutonium Reclamation Facility", dated May 15, 1963, by C. L. Brown, B. F. Judson, and E. O. Swain.
- HW-77770, Part II, Unclassified, "The Hanford Isotopes Production Plant Engineering Study", dated July 1, 1963, by J. R. LeRiviere, et al.
- HW-77962, Unclassified, "Drop Test of Unbuffered 1/4 Size Model HAP0-IB Cask", dated June 25, 1963, by C. W. Smith.
- HW-78061, Secret, "Waste Management Program Process Flowsheets", dated July 8, 1963, by H. C. Rathvon and P. W. Smith.
- HW-78091, Secret AWD, "Progress Report - Weapons Process Engineering - June, 1963", dated July 3, 1963, compiled by members of the Weapons Process Engineering.
- HW-78112, Secret, "Analysis of Isotopic Exchange Samples 4631 and 4632", dated July 3, 1963, by O. F. Beaulieu.
- HW-78119 RD, Secret, "CPD Plutonium Inventory" dated July 3, 1963, by J. H. Warren.
- HW-78120, Unclassified, "Critical Mass Control Specification - Calibration for Future Monitoring of the Incinerator Hood Using 380 KEV Gamma Count Rates - 232-Z Building", dated July 8, 1963, by R. J. Sloat.

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- HW-78148, Secret, "Dibasic Aluminum Nitrate for the Redox Process", dated July 9, 1963, by R. A. Yoder.
- HW-78177, Secret AWD, "Quarterly Summary Report and Associated Data for 234-5 Building Final Product Shipped During the Second Quarter of CY 1963", dated July 10, 1963, by A. E. Smith.
- HW-78183, Unclassified, "Critical Mass Control Procedure and Specifications for 222-S Building", dated July 15, 1963, by C. A. Colvin.
- HW-78195, Secret AWD, "Plutonium Phase Diagram", dated July 11, 1963, by C. M. Walker.
- HW-78251, Secret AWD, "A-Line Process", dated July 12, 1963, by R. E. Van der Cook.
- HW-78265, Secret, "Project Proposal, Degreasing and Briquetting Facility - RMA Line - 234-5 Building (Project CAC-109)", dated July 17, 1963, by M. N. Raile.
- HW-78266, Secret, "Project Proposal, Additional Plutonium Casting Facilities - RMA - 234-5 Building (Project CAC-110)", dated July 17, 1963, by M. N. Raile.
- HW-78267, Secret AWD, "Process and Process Performance", dated July 16, 1963, by A. E. Smith.
- HW-78275, Secret, "Process Specifications for Operational Control - Purex and B-Plant Fission Product Recovery Processes", dated July 16, 1963, by S. J. Beard and B. F. Judson.
- HW-78279, Secret, "CPD Waste Status Summary - January 1, 1963 Through June 30, 1963", dated July 15, 1963, by R. E. Roberts.
- HW-78290, Secret, "Estimated Fill Rates for 241-A, 241-AX and 241-SX Tank Farms", dated July 15, 1963, by R. C. Forsman, G. L. Hanson, R. E. Roberts.
- HW-78293, Secret, "Analysis of Plutonium Samples (No. XXX) on Interplant Exchange Program", dated July 17, 1963, by O. F. Beaulieu.
- HW-78328 RD, Secret, "Purex Plant Production Schedule, August 1963", dated July 25, 1963, by D. McDonald.
- HW-78329 RD, Secret, "Redox Plant Production Schedule, August 1963", dated July 25, 1963, by D. McDonald.
- HW-78330 RD, Secret, "UO₃ Plant Production Schedule, August 1963", dated July 25, 1963, by D. McDonald.
- HW-78331 RD, Secret, "234-5 Plant Production Schedule, August 1963", dated July 25, 1963, by D. McDonald.
- HW-78335, Secret, "Miscellaneous Scrap Treatment in the Plutonium Reclamation Facility (CAC-880)", dated July 29, 1963, by L. E. Bruns.
- HW-78360, Unclassified, "Design Scope of Miscellaneous Treatment Room Equipment - Project CAC-880", dated July 24, 1963, by E. O. Swain.

B. PREPARED FOR SIGNATURE AND ISSUANCE

HW-78075, Secret, "Production - June 1963", dated July 1, 1963, by
W. E. Johnson.

HW-78187, Secret, "HAPO Production Forecast - July 1, 1963 Through June 30,
1968", dated July 25, 1963, by W. E. Johnson.

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

JULY, 1963

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

General Manager
Chemical Processing Department

DECLASSIFIED

END

**DATE
FILMED**

3 / 18 / 93