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HW 71187

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT
FOR

SEPTEMBER, 1961

Compiled By
OPERATION MANAGERS

October 20, 1961

HANFORD ATOMIC PRODUCTS OPERATION
RICHLAND, WASHINGTON

HW--71187-Del.

DE93 004395

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STAFF

General Manager, Atomic Products Division	L. R. Fink
General Manager, Hanford Atomic Products Operation	W. E. Johnson
General Manager, Chemical Processing Department	P. H. Reinker
Manager, Production	J. H. Warren
Manager, Purex	P. R. McMurray
Manager, Special Separation Processing and Auxiliaries	C. T. Groswith
Manager, Finished Products	W. J. Gartin
Manager, Power and General Maintenance	T. G. LaFollette
Manager, Facilities Engineering	H. P. Shaw
Manager, Research and Engineering	(Acting) R. E. Tomlinson
Manager, Finance	K. G. Grimm
Manager, Employee Relations	R. B. Britton

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

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I. SUMMARY

Production through September, as compared with the June 28, 1961 HAPO Production Forecast (HW-69958), is summarized below:

	<u>Percent of Forecast Achieved</u>	
	<u>September</u>	<u>Fiscal Year To Date</u>
Separated plutonium nitrate	90.0	102.9
Separated uranium nitrate	94.5	106.1
Uranium oxide	63.6	87.1
Plutonium metal buttons	94.4	132.3
Fabricated parts	92.3	104.2

September production was below that forecasted primarily because of scheduled shutdowns in the Purex and Redox plants to recover the neptunium inventories. Except for uranium oxide, however, fiscal year-to-date production exceeds forecasted quantities. The uranium oxide production was limited by a temporary feed shortage.

Sixty-six thousand curies of cesium-137 were loaded into two shielded transfer tanks and delivered to the AEC for shipment to ORNL.

Purex processing was resumed on September 10 following a scheduled shutdown to recover the neptunium inventory and to perform maintenance repairs. Although improved operating stability was achieved with the scrub cartridge (10 percent free area) installed last month in the final uranium extraction column, process decontamination performance was unsatisfactory. The problem was resolved by replacing the scrub cartridge with one containing 6 percent free area and wider spaced plates in the center and upper sections. A plant shutdown was not required for the change.

A routine sixty percent nitric acid cleanout of the Redox solvent extraction system yielded 675 grams of plutonium from the columns, vents and associated vessels. The major contribution (550 grams) came from the partition columns 1A and 1B. Potential causes for this minor deposition are being sought from recent Redox operations history.

The summary report covering the process design basis for the 241-AX Waste Tank Farm was completed. This summary reflects the reduction in budget allocation from 4 to 2.7 million dollars, involving only four waste tanks as compared to eight tanks carried in the project proposal.

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Construction forces started work in the 221-B Building canyon on September 18 1961 to provide storage for fission products concentrates (Project CGC-897).

To provide leak detection for high-level waste storage tanks, Directive No. AEC-195, Modification 1, was issued on September 27, 1961, for the estimated project cost of \$510,000. Design has been completed.

Detailed design work on the HAPO IV Cask, initiated to provide a feasible means for shipment of large quantities of Cesium-137 without purification steps, has advanced to the point where a 500-gallon cask appears feasible. This cask is being designed to HAPO criteria on impact, insulation, and fire resistance. The HAPO IV Cask could be loaded directly in either the Purex loadout system or the "C" waste tank farm loadout system.

P. H. Reinker

General Manager
Chemical Processing Department

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS

A. Production Statistics

a. Percent of Forecast(1) Achieved

	<u>September</u>	<u>Fiscal Year to Date</u>
Separated plutonium nitrate	90.0	102.9
Separated uranium nitrate	94.5	106.1
Uranium oxide	63.6	87.1
Plutonium metal buttons	94.4	132.3
Fabricated parts	92.3	104.2

b. Purex

	<u>September</u>	<u>August</u>
Uranium nitrate produced (tons)	496.54	634.63
Average production rate during operation (T/D)	24.7	25.0
Total waste loss (%)		
Plutonium	0.34	0.36
Uranium	0.16	0.20
On-line efficiency (%)	66.9	90.0

c. Redox

Uranium nitrate produced (tons)	60.75	126.79
Average production rate during operation (T/D)	8.9	8.7
Total waste loss (%)		
Plutonium	0.20	0.27
Uranium	0.12	0.12
On-line efficiency (%)	38.2	63.4

d. Uranium Reduction (tons)

Normal UO ₃ loaded	304.32	626.44
Enriched UO ₃ loaded	54.70	101.2
Normal UO ₃ approved for shipment	348.27	652.70
Enriched UO ₃ approved for shipment	93.08	96.81
Normal UO ₃ shipped	500.64	501.24
Enriched UO ₃ shipped	189.79	145.11
Normal UNH backlog	472	204
Enriched UNH backlog	158	157

(1) HW-69958, HAPO PRODUCTION FORECAST, dated June 28, 1961

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e. <u>Plutonium Metal Processing</u>	<u>September</u>	<u>August</u>
Input to Task I (batches)	285	476
Reduction yield (%)	96.2	98.44
Product recovery output (Kgs)	191.32	262.54
Product recovery backlog (Kgs)	407.2	449.2
Waste disposal (grams)	563	786
f. <u>Power</u>	<u>200-East</u>	<u>200-West</u>
Raw water pumped (gpm)	10 872	4 960
Filtered water pumped (gpm)	1 273	1 077
Maximum steam generated (lbs. /hr.)	232 000	90 000
Average steam generated (lbs./hr.)	165 512	69 535
Total steam generated (M lbs.)	118 893	50 065
Coal consumed (est. tons)	6 185	2 740

September production was below that forecasted primarily because of scheduled shutdowns in the Purex and Redox plants to recover the neptunium inventories. Except for uranium oxide, however, fiscal year-to-date production exceeds forecasted quantities. The uranium oxide production was limited by a temporary feed shortage.

J. H. Warren
Manager - Production

CHEMICAL PROCESSING DEPARTMENT
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II ACHIEVEMENTS (Continued)

B. PUREX OPERATION

1. Operating Continuity

The plant was started up on 9-10-61 at a capacity factor of 3.0, following a scheduled shutdown for maintenance. Operation from this period to 9-30-61 was continuous except for one shutdown of four hours for an HAF (precycle feed pump) replacement. The capacity factor remained at 3.0 except for a period of eight days at 3.3.

A successful neptunium run was completed on 9-4-61. Plutonium product met specifications the entire month. In addition the high plutonium from the previous month was successfully blended off. No out-of-specification plutonium was on hand at month's end.

Some difficulty was encountered with high plutonium (7-14 ppb) in the uranium product prior to changing the K-2 (uranium decontamination) column scrub cartridge. The difficulty was immediately solved by the change.

Product waste losses were normal.

2. Processing Operation

Following installation of the K-2 column scrub section cartridge of ten percent free area, the uranium product was out of specifications on plutonium content and higher-than-normal gamma ratios were encountered. It was decided to modify the six percent free area cartridge which had previously been removed. These moves were successfully completed without a plant shutdown and no further problems have been encountered.

A new diluent, Soltrol, is undergoing tests in the plant during this run period.

Two shielded transfer tanks, totaling 66 kilocuries of cesium 137, were shipped to ORNL on 9-30-61.

Three hundred ninety-five kilocuries of strontium 90 were transferred from the 002 CR Tank to the Hot Semiworks.

One series of runs aimed at obtaining a crude cut of promethium was completed. The promethium was lost to waste in this first trial. On 9-26-61 the second series of runs was initiated. At the end of this

report period the material was undergoing the concentration step. This promethium crude is for Research and Development studies in the 300 Area High Level Cells.

3. Mechanical Experience

Installation of equipment associated with the formaldehyde project was essentially completed. Only the work of making the final tie-ins to the process remains to be done.

The modifications of the F-11 west, F-6 east, and H-4 tube bundle condensate systems were completed. The diaphragm-operated valves which replaced the steam traps have been in operation for the entire run period.

The HAF (precycle feed pump) was changed on 9-18-61 due to excessive upper seal leakage.

A metal dissolver (A-3) was out of service for three days due to a faulty thermohm jumper which was successfully replaced.

Minor Construction is continuing on the alterations of piping for the neptanium project.

The failed U-1-1 (recovered nitric) pump was replaced with a re-conditioned spare unit. The failed pump, which was a prototype designed for long service life, failed after 22 months when a connecting flange on the discharge head broke loose from a weld.

The F-7 (acid waste feed) and H-1 (precycle feed) pumps were replaced with new spare units when upper seal leakage became excessive.

Installation of a new HAPO-designed prototype agitator in E-3 tank was completed. The unit is designed to minimize bent shaft problems. Basic improvements include a 10 hp, 285 rpm motor and a 4" hollow agitator shaft. The unit removed from E-3 (15 hp, 600 rpm, 2" solid agitator shaft) will be retained as a hot spare.

New all-welded stainless steel piping was installed in trap pit No. 4, replacing the old carbon steel piping assemblies associated with condensate discharge from H-4 (backcycle) concentrator tube bundles. New in-canyon diaphragm-operated valve jumpers were installed for steam and condensate control of both tube bundles. Operation of concentrators with diaphragm-operated valves rather than the steam traps has proven satisfactory to date.

The 2-D column stainless steel cartridge assembly (6 percent free area) was replaced during planned outage with a cartridge consisting of 10 percent free area plates to improve column operation. Since results of this change were not entirely satisfactory alterations were initiated on the 6 percent free area cartridge which was removed. The change consisted of increasing the spacing between the sieve plates in the center and top sections. Following the installation of the modified cartridge the performance of the 2-D column was entirely satisfactory.

N Cell modification completed during the shutdown consisted of installation of a new push tank with the push probe centered in the tank. Improved operation of the push probe resulted. In addition, a defective XCP screen assembly and faulty CRC probe were replaced.

4. Radiation Experience

The total radio-iodine 131 emission was 18 curies for the period. The maximum seven-day emission was 9.5 curies.

There were two Radiation Occurrences and four cases of skin contamination.

5. Analytical Experience

A spectrophotometer method was developed to determine nitrate concentration in formaldehyde reactor samples. Analyses of synthetic F-15 material with a formaldehyde matrix gave excellent results.

Preliminary investigations of routinely determining the plutonium content of dissolver solution have been promising. Seven controlled potential coulometer results of a synthetic dissolver solution gave an average plutonium percent recovery of 99.9. The operation of the coulometer was unaffected by carrying the signal from the coulometer cell over 300 feet of cable.

6. Events Influencing Costs

Purex bore the cost of the TBP (tri-butyl-phosphate) used in making up organic for the plant testing of a new diluent, Soltrol.

SG Smolen
Acting Manager-Purex

SG Smolen:EAF:gt

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CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (Continued)

C. SPECIAL SEPARATION PROCESSING AND AUXILIARIES OPERATION

1. Operating Continuity

Operation of the Redox Plant continued until September 15, when it was shutdown as scheduled for neptunium recovery and an acid flush of the equipment. Neptunium recovery, amounting to 1.28 kilograms was excellent, representing a recovery of 96 percent.

2. Processing Operations

E-metal processing was conducted as scheduled until September 15, at which time operations were suspended on a planned basis to recover the neptunium inventory which had been accumulating in the precycle system since May 15, 1961. The scheduled E-metal production for the month was achieved prior to the shutdown.

The neptunium recovery run (sixth to date) was completed in five days and a total of 1282 grams (96%) of the estimated 1325 grams in the feed solution was recovered.

The neptunium recovery run was followed by a nitric acid flush of the processing equipment as a critical mass control measure. A sixty percent nitric acid flush of the extraction columns, overflow lines and associated vessels in the 202-S Canyon Building recovered 675 grams of plutonium, the major portion (550 grams) coming from the partition cycle columns (1A and 1B). Possible causes for this minor deposition are being investigated. A total of 144 grams of plutonium was recovered from the process vessels in the 233-S Concentration Building. An additional 1600 grams, lost through a pin-hole leak in the plutonium stripper concentrator tower (L-2), was recovered from the "Greenhouse" floor. The pin-hole leak, which was caused by crevice corrosion, has been repaired.

Some trouble was experienced with nitric acid control in the F-1 and F-2 feed tanks (for the 2D column in the partition cycle) on 9-6-61. As a result the decontamination efficiency in the 2D column was lost for about 16 hours. All uranium batches were adequately decontaminated in the E-13 ozonator, but the effect of the upset on plutonium was obscured by the loss of the sodium bismuthate addition to the E-2 plutonium ozonator for four hours

and a test flowsheet run on the 2A column (second plutonium cycle) for approximately three hours.

On 9-7-61, the sodium bismuthate addition to the E-2 plutonium ozonator tank stopped when the pressure switch interlock to the pot vacuum failed. As a result, no sodium bismuthate was added for a period of approximately four hours and high gamma ratios on several plutonium batches were encountered.

A test flowsheet run to determine if adequate oxidation of plutonium can be done in the 2A column (second plutonium cycle) was run on 9-7-61. The oxidation of plutonium in the column was apparently successful, however, decontamination across the column did not appear to be satisfactory and the test was terminated after three hours.

The problems encountered with nitric acid control in the F-1 and F-2 feed tanks, the sodium bismuthate loss in E-2 and the 2A column test run (all noted above) resulted in approximately 9.5 Kg of plutonium production being out of gamma ratio shipping specifications. This material has all been loaded into FR cans and will be combined with synthetic startup feed so that no rework costs will be incurred.

3. Mechanical Experience

The two stage pump-agitator, installed in the E-3 plutonium sampler tank on 8-29-61, became very erratic and showed signs of imminent failure when processing operations were shutdown on 9-15-61. It was replaced on 9-21-61 with a spare unit equipped with a new thrust bearing located above the mounting flange. The new bearing replaces a radial type bearing and is designed to support the weight of the shaft and impellers as well as the thrust created by the pump head. The old bearing was not capable of doing this and thus is believed to have resulted in the frequent equipment failures in this position.

The pump in the 2D column feed tank (F-1) failed and was replaced with a reconditioned unit on 9-30-61. The failed pump had been in operation for approximately 2,833 hours since it was originally installed on 12-30-60.

Eleven canyon cell jumpers were installed during the month. Two were replacements for failed equipment and nine were new prototype project jumpers installed in F cell. The prototype jumpers are designed to give: (1) precise flow control on backcycle waste from the D-14 backcycle concentrator to the 1A precycle column, and (2) an accurate acid measurement of the waste flowing from the 2D partition cycle column to the D-14 backcycle concentrator.

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4. Waste Handling and Decontamination

Equipment valued at approximately \$59,000 was received from the processing plants for decontamination, repair or inspection during the month. Equipment valued at \$29,232 was returned to customers. A savings of approximately \$15,000 over the cost of new replacement equipment was realized through the equipment decontamination program during the month.

A total of 228 man-hours was charged to the decontamination and repair of railroad, automotive, and heavy equipment. The following is a breakdown of the major items decontaminated:

<u>Item</u>	<u>Operation Charged</u>
Flat Car No. 3626	Redox
Well Car No. 43	CPD
Panel Truck No. 1K-428	Patrol
Sedan No. 1A-1004	"
Ladder Truck	Electrical Distribution
UNH Tractor Truck	Parex
Pickup Truck No. 1C-180	"
Lowboy Trailer	F&GM
Water Truck	"
D-8 Caterpillar Tractor	"
Evacuation Bus No. 1B-6674	Transportation
Truck Trailer	HLO
1500 Gal. Tank Truck	"
5 ft. x 8 ft. SS Tank	"
800 lb. Sample Pig	"

5. Radiation Experience

There were no radiation occurrences and only three minor fission product skin contamination cases reported during the month. All skin contamination cases were readily reduced to non-detectable.

Advantage was taken of the Redox Plant shutdown for repeated decontamination assaults on the Redox Canyon 60-Ton crane. Radiation dose rates have been reduced three-fold and the radiation status of the crane is now comparable to conditions which existed prior to the multipurpose dissolver incident of April 1960.

6. Analytical Experience

Analytical assistance was provided to the Development and Corrosion Chemistry Group, Hanford Laboratories Operation, in their study to select an organic solvent which will satisfactorily

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extract uranium from a milling solution. This solution is currently being used by the Fuels Preparation Department for milling the ends of uranium fuel elements by controlled dissolution. If the uranium can be satisfactorily extracted, the solution can be reused, thus permitting considerable chemical savings.

Chas. S. Dinsworth

Manager - Special Separation
Processing and Auxiliaries

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CHEMICAL PROCESSING DEPARTMENT
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SEPTEMBER, 1961

II. ACHIEVEMENTS (Continued)

D. FINISHED PRODUCTS OPERATION

1. Operating Continuity

The fabrication facilities operated continuously during the month with only five percent of the effort being devoted to test activities. Unfabricated plutonium production was limited by a low feed supply during the early part of the month. Recovery output exceeded the schedule in spite of several mechanical failures and a required flush of the system. The output of depleted uranium oxide was limited by delays in the receipt of feed during the early part of the month, and the production of enriched material was reduced by the unavailability of shipping containers.

2. Processing Operations

a. Plutonium Fabrication

Information on plutonium fabrication is presented in Document HW-71302 entitled "Chemical Processing Department, Finished Products Operation, Z Plant Monthly Report, September, 1961," classified "Secret, Atomic Weapon Data, Production Rate and Stockpile Quantity Information."

b. Plutonium Processing

Operation of the plutonium processing facilities was normal during the month and all feed was processed as soon as it became available.

The recovery facilities operated at the high rates established last month, and the schedule was exceeded by 28 percent in spite of a number of mechanical failures. The system was flushed during the last week of the month.

c. Uranium Reduction

Production of depleted uranium oxide was limited by feed shortages during the first half of September and was normal during the remainder of the month. A shortage of shipping containers reduced the output of enriched uranium oxide. However, the equipment was used for the production of 45 tons of enriched material, packaged in 30 gallon drums for the National Lead Company.

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3. Mechanical Performance

Plutonium fabrication equipment continued to function well. Pre-startup work on two new Gorton lathes was completed during the month.

Plutonium processing equipment performed satisfactorily with only routine maintenance being required. Plutonium recovery equipment continued to require excessive maintenance work on leaking valves, plugged lines, etc. In addition, three of the metal dissolver pots failed due to corrosion. The H-2 column bellows ruptured, and three pumps and an agitator required replacement.

Equipment performance in the Uranium Reduction plant was satisfactory during the month. Repairs to the "G" calciner were completed late in the month and this unit will be returned to enriched uranium service in October.

4. Radiation Experience

Film badge results this month for a laboratory employee revealed an additional 845 mr exposure (in addition to the 2100 mr covered in the August report for the same employee). She has been removed from radiation work, and the investigation to determine the source continues. The badge results indicate a high energy gamma radiation that is not normally present at her work station. There were no unusual readings on the badges of any other employees.

One case of plutonium deposition occurred as a result of a puncture wound. Estimated deposition was one percent of the Maximum Permissible Limit.

5. Analytical Experience

	<u>August</u>	<u>September</u>
Number of Samples Received	2,148	1,915
Number of Determinations	21,706	15,385
Total Metallic Impurities, Buttons	582 ppm	673 ppm
Total Carbon Content, Buttons	400 ppm	415 ppm
Buttons Rejected	0.0%	0.0%

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W. J. Gorton
Manager,
Finished Products

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II. ACHIEVEMENTS (continued)

E. POWER AND GENERAL MAINTENANCE OPERATION

1. Operating Continuity

There were no outages of steam, water, or emergency electrical services that affected continuity of operation of the prime production facilities during the period covered by this report.

2. Inspection, Maintenance and Repair

Special emphasis was placed on expediting fabrication of a multipurpose dissolver for the Redox Facility. The work was an estimated 38 per cent complete at month end.

Extensive modifications were made, on an emergency basis, to the 6 per cent free-area cartridge for the final uranium decontamination column (K2) at the Purex Facility. This cartridge was originally installed in June 1961, but was replaced with a 10 per cent free-area unit the following August. Failure of the 10 per cent free-area unit to render satisfactory performance necessitated modification and reinstallation of the original 6 per cent free-area unit. Modifications consisted of increasing the spacing between the plates in the upper half of the cartridge.

Alteration to the second HAPO I and II Casks proceeded on a high-priority basis. Work consisted of: (1) changing the closure seals on the filter from "Snap-Tite" fittings to miniature three-jaw remote connectors; (2) fabricating new Wood's metal expansion assemblies; and (3) conducting a heating cycle test on the HAPO I Cask to determine if filter leaks would develop from rapid temperature changes. This work was approximately 50 per cent complete at month end.

Progress continued on the fabrication of a J-cell package for the continuous Brandy Recovery Program at the Purex Facility. Work on the dunnage and structure is an estimated 60 per cent complete at this time.

Cell pipe jumper fabrication totaled 21 units for the month. Seventeen were for the Brandy Project at Purex, and the remainder were replacements for malfunctioning in-service units.

A prototypical slow-speed (300 rpm) agitator was made ready and installed in a Fission Product Recovery Tank (E-3) at the Purex Facility. The slow speed eliminates the vortex and allows the slurry to be agitated down to extremely low liquid levels, which are necessary in the Fission Product Recovery Program. Operation of the standard 600 rpm agitators at low liquid levels results in premature mechanical failure.

Installation of the HF Column and associated piping and equipment in the Solvent Extraction Hood in Finished Products Operation's Recuplex Facility was completed. This equipment was required for reprocessing materials recovered from the hood floor during clean up.

Progress continued on the installation of the prototypical dynametrics scale hood and associated equipment in Finished Products Operation's final inspection area. This equipment will be used to remotely weigh and type the weights of plutonium shapes. The work is 40 per cent complete, with final completion scheduled for November 1.

Satisfactory progress was made on the installation of three Purex Brandy samplers located in the sample gallery in the 202-A Building. The work was 40 per cent complete at month end, with final completion scheduled for December 1.

The Pipe and Operating Gallery piping phase of the Purex Brandy Project was started this month and is showing satisfactory progress. Gang valve and other required piping assemblies are in the process of fabrication, with completion scheduled for January 1, 1962.

A slight reduction in essential material costs will be realized as a result of recent corrosion tests of the Department's sanitary water. Results of tests by Betz Laboratories, Inc., indicate that lime feeding in the Department's water-filtration plants can be discontinued, except during periods of high-water turbidity.

Assistance rendered other departments included concentrating the activities of the air-balance group on Irradiation Processing Department's Reactor Confinement Program. (Project CGL-791.) Air conditioning systems in 105 Buildings F, H, and DR were balanced during the month.

A test was conducted on power equipment designed to supply emergency electrical power to the Purex Facility. All units came on the line normally and functioned satisfactorily in every respect.

Progress of the work was adversely affected when a large number of the Department's welders elected to absent themselves from the job for two successive days. The movement was in sympathy for one of their number who had been subjected to disciplinary action for insubordination. Appropriate disciplinary measures were placed in effect in regards to all who participated in this unauthorized work stoppage.

T. S. LaFollett

Manager
Power & General Maintenance

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

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II. ACHIEVEMENTS (continued)

F. FACILITIES ENGINEERING OPERATION

1. Purex

a. Process Design Engineering

E-F6 and E-F11 Concentrator Design

Conceptual process design drawings of a sectionalized canyon-type concentrator for F-6 and F-11 service were completed. This concentrator features two sections, a bottom re-boiler and a separate remotable demister. Existing standard Purex concentrator tube bundles, jumper, and condensers can be used interchangeably with present equipment. The advantages of the sectionalized design are: (1) a cost saving of about \$70,000 per concentrator; (2) vessel failure will require replacement of the defective section only, thus reducing maintenance and disposal costs drastically; (3) improved decontamination performance achieved through use of a demister rather than dry bubble caps. The above concept was advanced for use when new spare concentrators are required.

241-AX Waste Tank Farm

The summary report covering the process design basis for the 241-AX waste tank farm was completed and approved by the working representatives. This summary reflects the reduction in Washington AEC budget allocation from 4 to 2.7 million dollars involving only four waste tanks rather than the eight carried in the project proposal. Engineering flow diagrams and diversion box flow diverter drawings were completed and issued for comment.

Concentrator Condensate Disposal

Four of the ten Purex concentrator tube bundles have been equipped with remote valves for holding pressure in the steam chest. Valves for the other six tube bundles have also arrived and will be installed during the next regularly scheduled plant shutdown.

Start-up of the concentrators, equipped with remote valves, H-4 F-6, and F-11, proceeded smoothly and valve control presented no unusual problems. Operation of these concentrators has been steady for about three weeks.

Line Voltage Monitor

The recently completed prototype of a power circuit voltage and noise monitor is being used in 202-A Bldg. It has proven ef-

fective in helping to trace down the sources of electrical noise which have been causing trouble in some of the instrumentation. These tests are continuing.

b. Project Engineering

CGC-821 - Project Palm - Purex

Directive HW-478, Mod. #4, authorizing an increase of \$175,000 to a total of \$1,575,000, was issued September 21, 1961. The Notice to Proceed on Contract AT(45-1)-1650 for construction of purification facilities was issued on September 22, 1961, to Hanford Piping, Inc.

CGC-897 - Rev. #1 - Fission Product Concentrates Storage System--- 200-East Area

Construction forces started active construction work in the 221-B canyon on September 18. Cell #6 has been opened and some jumpers removed. Activity level of the removed jumpers after a water flush is less than 6 mr/hr. An extension of Burial Ground #4, located north of 221-B has been set aside for burial of contaminated equipment - primarily jumpers.

c. Manufacturing Engineering

Burial Box Construction Contracts

A contract was awarded on September 25, to Frank Lohse Construction Company, for construction of a large wooden storage box for the K-2 tower and a hinged-end concrete box for obsolete jumpers in diversion boxes. The bid was \$10,450. Construction is to be completed by November 4. A concrete tube bundle burial box was completed by George Grant Company and was formally accepted on September 15.

2. Special Separations Processing

a. Process Design Engineering

Heat Transfer Services

A process design review of all Redox boil-up vessels has been completed and a summary letter of recommendation prepared. Included in the recommendations were: (1) no new bayonet tube bundles should be procured; new units should be of improved design; (2) the E-10 and F-5 concentrator vessels should be redesigned before procurement of replacement units is planned; and (3) a system of water injection or steam condensate flushing should be installed on the G-3 system to eliminate excessive velocities in the steam condensate piping. Process design work is being undertaken in the improvement areas noted above.

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Following replacement of a leaking gasket on one of the G-3 tube bundle flanges, and a five percent nitric acid flush of both bundles, heat transfer has been much improved and no longer appears to be a limiting factor in plant capacity.

b. Project Engineering

CAC-928 - Leak Detection - High-level Waste Tanks - 241-A and 241-SX

Directive AEC-195, Mod. #1, was issued on September 27, 1961, for the estimated project cost of \$510,000. Design is complete and issuance of bid package information for 88 detection wells is awaiting receipt of a Work Authority Modification.

CGC-941 - Railroad Tunnel Airlock and Decontamination Facilities - Redox

The project proposal requesting installation of a railroad tunnel airlock and well car decontamination facility at Redox was returned without approval on September 11, 1961, for re-study.

c. Manufacturing Engineering

Multipurpose Transfer Box

A contract for construction of this transfer box was awarded to Cecil Hill Construction on September 5, at a bid price of \$28,853. Construction is scheduled for completion by November 4.

Burial Box Construction Contracts

Construction of four concrete boxes for burial of Redox equipment was completed on September 15, by George Grant Company and was formally accepted. Container design for burial of an H-4 vessel and tower is being initiated.

3. Finished Products

a. Process Design Engineering

Hermetically-sealed Equipment

Development of hermetically-sealed equipment has paralleled the effort of refining the flange sealing technique. Prototype installations of pumps, flowmeters, and samplers have been completed in the test unit. An hermetically-sealed tank agitator unit has now been constructed. Further testing is scheduled.

Continuous Dissolver and Fusion Hood Design

Fabrication of the prototypical Miscellaneous Treatment Room glove boxes for skull burning, continuous HNO_3 -HF dissolution, and ammonium bifluoride fusion has been delayed because the

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estimated cost exceeded available funds. This problem has now been resolved with FPO agreeing to absorb approximately half of the total cost. Fabrication by Minor Construction will begin next month.

Continuous Task III

Detailed design drawings have been completed on the assembly for loading plutonium products out of the continuous electrolytic cell. This effort consisted of six approved drawings. Design liaison work will continue during the fabrication, installation, and start-up of this equipment.

Special Fabrication Line Equipment

Testing of the prototype Florturn machine on forming cones has been completed. Actual shape testing is awaiting new equipment such as the rotating blank holder and the pinch-cut-off device which the vendor is expected to supply late in October. A hydraulic drive unit was requisitioned to save space and reduce maintenance problems associated with the variable-speed electrical drive.

Action was initiated to procure the purchase specifications and the glove box drawings for the numerically-controlled machine lathes presently installed at Rocky Flats. Procurement of these lathes was discussed with vendor representatives who provided cost information and estimates on delivery time. They have agreed to provide more specific information for use in preparing purchase specifications.

b. Project Engineering

CGC-811 - Additional Plutonium Fabrication Facilities - 234-5 Building

Clean-up of the RMA Area, made necessary as a result of the August 16, 1961 contamination spread, was completed, including burial of contaminated salvage and scrap materials. The additional project cost attributable to the contamination spread was approximately \$5,150.

4. General

a. Process Design Engineering

Titanium Tube Bundles

A pre-bid conference was held on September 19, 1961, for all vendors interested in submitting quotations on the reboiler bundles. This formal conference was the first of its kind held on CPD equipment. The purpose was to secure a mutual understanding with the prospective vendors of the process criteria materials and fabrication requirements and achieve a higher standard of equipment quality and reliability. The vendors were

very responsive to the purpose of the conference, as well as the objectives of the standard of equipment reliability desired by CPD.

Fission Product Recovery

Detailed design work on the HAPO IV Cask, initiated to provide a safe means of shipment of large quantities of Cesium-137 without purification steps, has been advanced to the point where a 500 gallon cask appears feasible. This cask is being designed to HAPO criteria on impact, insulation, and fire resistance. The HAPO IV Cask could be loaded out directly in either the Purex loadout system or the "C" Waste Tank Farm loadout system.

NPR Casks and Cars

Process design report covering NPR Casks and Cask Cars was completed, approved by working and IPD representatives, and forwarded for final approval and transmittal to the Commission. Six casks and two cask cars will be provided. Each cask will have capacity for four NPR fuel canisters. Each car will contain two casks. The cars were designed to be adaptable to use with standard HAPO casks.

b. Project Engineering

Project Cost Information as of September 17, 1961:

Total Authorized Funds - 12 active projects--	\$11,158,000
Total Cost-to-date-----	5,939,000
Commitments and Open Work Releases-----	948,000
Unencumbered Balance-----	4,271,000
Costs Charged to Above Projects -	
8/20/61 - 9/17/61-----	229,495

H. P. Shaw, Manager
Facilities Engineering Operation
CHEMICAL PROCESSING DEPARTMENT

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

SEPTEMBER, 1961

II. ACHIEVEMENTS (Continued)

G. RESEARCH AND ENGINEERING OPERATION

1. Purex Process Technology - D. F. Johnson

a. Fission Product Recovery

Two peroxyacetate runs were performed during the month to test the recovery and decontamination of cerium-144 and promethium-147 from Purex high activity waste. Feed for the peroxyacetate tests was prepared by sulfate precipitation of INW, followed by carbonate and oxalate treatment to precipitate the cerium and trivalent rare earths (TRE) as oxalates. The peroxyacetate flowsheet as published in HW-62505 "The Separation of Cerium from the Trivalent Rare Earths Using Hydrogen Peroxide and Sodium Acetate", by E. J. Wheelwright and N. C. Howard, dated May 18, 1960, was followed except the hydrogen-peroxide concentration in the two runs was two and four fold above flowsheet, respectively. Material balance data indicated that approximately fifty per cent of the cerium and promethium (TRE) was recovered in each run; in the second run, the decontamination factor for separation of TRE from cerium was increased from two to eighteen and for separation of cerium from promethium (TRE) from two to five.

b. Solvent Extraction

Decontamination in the First Solvent Extraction Cycle was increased 1.5 to 2 fold over the August performance despite lower HA Column organic phase uranium saturation, and plutonium losses of less than 0.03 per cent in the HA Column effluent (HAW). The improved HA Column performance was attributed mainly to improved solvent quality; however, 2A and 2D Column decontamination performances were sub-normal. A two-fold improvement in 2A Column decontamination resulted from a fifteen per cent increase in pulse frequency.

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Although the stability of the ten per cent free area, nozzle plate, scrub section 2D Column cartridge was satisfactory, the decontamination performance was substandard despite adjustments in operating conditions and flowsheet. Gamma ratios of the uranium product ranged from 4.5 to 8, the plutonium concentration in the uranium product varied from 4 to 13 parts per billion and the neptunium losses to the uranium product were as high as thirty per cent of the neptunium in the virgin feed. Replacement of the ten per cent free area cartridge with a cartridge composed of six per cent free area nozzle plates on a graded spacing pattern improved decontamination and avoided the flooding experienced with the six per cent free area plates on two inch spacing. Subsequent uranium product gamma ratios were in the 2.0 to 3.0 range, the plutonium concentration in the uranium was $\frac{1}{1.0}$ part per billion and neptunium losses to the uranium returned to a normal one to two per cent.

c. Neptunium Recovery

Neptunium accumulation in the Backcycle Waste System (3WB) was below normal during the report period due to poor 2D scrub cartridge performance and a period of high losses from the HA Column. The instantaneous losses to the HA Column effluent (HAW) were a factor of two above those usually experienced due to a low nitrite concentration in the HA-HS system associated with new diluent. The loss was restored to normal by increasing the HA Column nitrite addition until the organic overflow nitrite concentration was 4×10^{-4} M.

d. Solvent Treatment

Prior to plant startup, the entire solvent inventory was removed from plant and vessels flushed twice with a new diluent, Soltrol-170. The two solvent treatment systems were then charged with new solvent using Soltrol-170 as diluent vice Shell E-2342. Upon plant startup, the gamma activity of the solvent in the No. 1 System rapidly increased to about 5000 microcuries per gallon (due to the activity released but not removed during the flushing operations). Continued operation slowly reduced the gamma activity to 1000 - 2000 microcuries per gallon where it remained during the remainder of the report period.

e. Waste Treatment

Test indicated that flushing the towers on the two waste concentrators (E-F6 and E-F11) with caustic-tartrate during the shutdown returned the concentrator capacities to normal. The reason for plugging of these towers has not as yet been determined.

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DECLASSIFIED2. Redox Process Technologya. Solvent Extraction

A scouting test was run to determine the feasibility of oxidizing the partition column plutonium product stream (1BP-Pu^{III}) in the extraction section of the second plutonium decontamination cycle column (2A) by adding dichromate in the scrub stream (2AS). If this can be done successfully, the present batchwise oxidation system can be by-passed, thereby improving nuclear safety and reducing the amount of salting agent required. During the three-hour test at least 90 percent of the input plutonium was oxidized and extracted from the column. Any plutonium not extracted was recycled to the Precycle (HA) Column with the 2A Column raffinate. The loss of acid control in the partition cycle feed stream (1AFS) and the simultaneous inability to add sodium bismuthate oxidant to the plutonium ozonator (E-2) prevented evaluation of the column decontamination performance during the test. Further testing will aim at improving recovery and evaluating effects on decontamination.

b. Acid Flush

A 60 percent nitric acid flush of the extraction columns, overflow lines and associated vessels completed during the month recovered 675 grams of plutonium; the major portion (550 grams) from the partition cycle columns (1A and 1B). Potential causes for this minor deposition are being investigated. A total of 144 grams of plutonium was recovered from the process vessels in the 233-S Plutonium Concentration Building. An additional 1600 grams, lost through a leak in the plutonium stripper-concentrator tower (L-2) was recovered from the "Greenhouse" floor. The pin-hole leak, which was caused by crevice corrosion at a packing hand-hole, has since been repaired.

c. Neptunium Recovery

The fourth neptunium recovery run using the "standard" recovery flowsheet, was completed during the month. A total of 1282 grams (96 percent) of the estimated 1325 grams in the feed solution was recovered. Irrecoverable neptunium losses were negligible, since all process wastes were reworked. The product solution, sent to the Process Chemistry Operation for final purification and isolation, contained siliceous solids not detected in the plant samples and approximately four times more gamma-emitting fission product, as Ru-103, and Ru-106, than the two preceding runs.

d. Waste Storage

The non-boiling supernatant solution in the 114-SX tank was pumped to the 103-SX tank without difficulty after a five percent dilution had reduced the freezing point of the solution from 190 to 180 F. The tank contents were also heated approximately three degrees Fahrenheit by steam sparging through the air circulators prior to the transfer. After an interim cooling period in the 103-SX tank, this waste will be transferred to an older tank farm for storage. Other non-boiling 241-SX Area tanks will be handled in the same manner as the 114-SX tank so that the inherent difficulties of pumping hot concentrated waste solutions greater distances will be minimized.

Long-range plans require filling and re-filling of the 241-SX Area tanks with waste capable of self-concentration. Since the build-up of sludge may prevent adequate control of tank bottom temperatures, means of sludge removal are required. Currently the 114-SX tank has been re-filled with tank farm condensate to a depth of ten feet to determine how well the sludge can be dissolved or slurried using the air circulators.

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3. Finished Products Chemical Technology -

a. Recuplex

The prototypical installation for washing the organic solvent with hydrofluoric acid has been completed and preliminary testing is in progress. It is expected that the HF wash will improve solvent extraction performance by reducing the plutonium content of the solvent to a low value.

The recently developed non-reflux flowsheet was utilized successfully to process gross quantities of sump collected solutions that originated from equipment failures. This flowsheet is designed to expedite recovery of this heterogeneous material at the expense of production scrap feeds.

The new HF wash column is expected to be useful in processing sump collected material with minimum interference to routine operations.

4. Finished Products Fabrication Technology -

a. GE 312 Computer Test

Evaluations to date have demonstrated that the history file and a major part of the daily operation will depend on essentially 100 percent reliability of the paper tape, punch, and reader system. No where near this reliability has been attained to date and it has been necessary to closely check the performance of this equipment to prove out routines. The test should show whether or not these occasional errors from erratic equipment now being experienced can be tolerated.

The clock relay system has required extensive repair. Debugging of routines is progressing as rapidly as operable equipment will allow. New routines are being proven and test movements of line material becomes more extensive. Equipment failures continue, several clock breaker failures have caused parity errors on various tracks, the flexowriter, reader, and slave punch malfunctioned to cause a series of delays in debugging progress. The high speed punch caused an intermittent skipping of characters. (An interlock cam clutch was adjusted to correct this problem). A fuse was blown and replaced on the flexowriter, and the reader failed and was inoperative for three days; requiring that all input to the computer be entered manually. Gradually, the various breakdowns possible to the equipment are being experienced.

The program has been revised to permit four shell storage on three of the four levels in the 22-SR storage hood and four shell storage on all four levels of the 45-SR storage hood. Any additional storage cannot be handled in the program because all drum memory has been used.

5. Process Chemistry -

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a. Purex Process Assistance

Laboratory assistance in support of the Purex Process was primarily concerned with solvent quality during the period. A sample of G-5 (recovered solvent) taken on 9-12-61 was washed in the laboratory and the data obtained is shown in Table I. These results indicate that the solvent wash at the plant was not functioning efficiently. The G-5 aqueous sample was high in activity indicating considerable entrainment. The LCW sampler was not operating at this time so the actual fission product decontamination across the solvent recovery system could not be determined.

TABLE I

<u>Sample</u>	<u>ZrNb⁹⁵ μc/gal</u>	<u>DF</u>	<u>R-106 μc/gal</u>	<u>R-103 μc/gal</u>	<u>Fu retention c/m/gal</u>
G-5 as received	3.53×10^3		310	110	7.5×10^7
G-5-CO ₃ KMnO ₄ washed	204	16.5	67	49	9.4×10^6
G-5-Mg(OH) ₂ washed	178	19.8	81	78	4.1×10^7
G-5 Aqueous Layer	1.86×10^4		1.4×10^3	300	

A LCW (Tk-J7) organic sample was taken on 9-17-61 for laboratory evaluation. This sample also responded well to carbonate-permanganate treatment in the laboratory which reduced ZrNb⁹⁵ activity from 2.0×10^4 to 650 μc/gal for a DF of 31. The use of 1 M NaOH instead of 3% carbonate in the third contact gave a ZrNb⁹⁵ DF of 50. This data indicates that the solvent is in good condition and that improvement in plant wash performance should be possible.

b. Redox Process Assistance1. Acid Equilibrium Data

Laboratory studies have been completed concerning acid equilibrium between concentrated aluminum nitrate-uranyl nitrate solutions and condensate. These studies concern a means of decreasing the acidity of Redox streams by boiling off nitric acid. This method would reduce or replace the use of sodium hydroxide, thus reducing caustic consumption and undesirable sodium nitrate formation.

Laboratory work indicates that the condensate from the following solutions would be 0.5 M in HNO₃:

High salt solution as if it existed at 25 C.

The above salt solution has a clear point of less than 85 C.

c. Neptunium Purification

Purification of 189 grams of neptunium from dissolved reject elements combined with a portion of the 2068 grams of virgin neptunium from Purex was started September 5, but shut down shortly thereafter due to screen failure. Failure of the screen supporting the resin bed necessitated replacement of the screen and the resin before processing could be resumed.

The first batch of 796 grams of purified neptunium nitrate was shipped to Savannah River on September 18 and the second batch of 917 grams was scheduled to leave October 2. Analysis of the two batches of purified nitrate were as follows:

	<u>Batch 50</u>	<u>Batch 51</u>
Total Wt.	917	796
SpGr	1.078	1.081
Np, g/l	34.15	35.39
Pu, %, Np basis	0.093	0.003
U, %, Np basis	0.027	10.014
Th, %, Np basis	10.017	10.045
Gamma, $\mu\text{c/g}$ Np	16.3	12.7
ZrNb, $\mu\text{c/g}$ Np	0.077	0.11
Ru	Not detected	Not detected
Pa ²³³ , $\mu\text{c/g}$ Np	22.5	1.33
TMI, %, Np basis	0.002	0.24
HNO ₃ , M	1.03	0.56
Np(V), %	100	100

Near the end of the report period six cans of virgin neptunium were received from the Redox plant. These cans had a significant gamma reading which required filtering through a glass wool in-line filter while transferring it into the ion exchange facility feed tanks. Some plugging of the filter due to a black granular material was encountered. Analysis of the solid showed the activity was due to radio-ruthenium. Spectrographic analysis of the solids showed strong silica and tin with moderate amounts of iron, copper, and traces of other metals. A sample of the filtered material disclosed that 1142 grams of neptunium had been received contaminated with 135 grams

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of plutonium, 0.4 grams uranium, 0.18 curies of Zr,Nb, and 15 curies of radio-ruthenium.

d. Analytical Assistance

1. X-ray Fluorescence

The X-ray fluorescence spectrometer has been used as a referee and back-up method for the 222-S control laboratory analyses for the neptunium recovery program. The instrument was used to provide Np analyses for the feed and final product. This method checks the high precision TTA-alpha counting method and X-ray photometer to within $\pm 1\%$ on final product Np and checks the TTA to within $\pm 1\%$ on feed samples, whereas the X-ray photometer gives consistently high results. The high specificity of the X-ray spectrometer eliminates the need for separate analyses to correct for extraneous absorbing materials, as required for the X-ray photometer.

2. 256 Channel Analyzer

Mr. W. Thiel of the Radiation Counter Labs of Skokie, Ill., was engaged for two days by Redox to place the RCC Spectrum stripper in working condition. In the time at his disposal, he had the spectrum stripper operating properly but at the expense of proper operation of the 256 channel analyzer to which it was attached. His contracted time ran out before he was able to achieve satisfactory operation of the entire unit. Educationally, his time was well spent and further assistance will be forthcoming in the form of more recent and complete maintenance data, which will be forwarded from the factory.

A device for positioning low level gamma samples with reference to a three-inch scintillation detector has been designed and approved for use with the Redox 256 channel analyzer.

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6. 234-5 Development - H. [REDACTED], [REDACTED]

a. Incineration Project Support

Negligible chloride remains in the ash from plastic.

A sample of plastic bag material was burned to establish the path of the chloride contained in the plastic. Greater than 99 percent of the chloride was removed in the off-gas. Less than one percent remained in the combustion ash. The chloride in the off-gas and ash amounted to 12 percent by weight of the original plastic.

b. Plutonium Metal Dissolution

Dissolution of plutonium metal is being investigated in detail.

The penetration rate for plutonium metal in 10 M HNO₃ - 0.5 M HF is 72 mg/min/cm². The penetration rate was determined on disks of plutonium metal.

The dissolution rate for turnings in 0.5 M HF - 10 M HNO₃ is 5.4 g/min. It was found that if the dissolving solution were brought to a boil and the hydrofluoric acid added just before the first metal addition, the rate for 10 M HNO₃ - 0.5 M HF increased to 7.9 g/min. A much more vigorous reaction resulted using this technique and some boil-over occurred.

The continuous dissolver for plutonium metal turnings has been set up and tested with steel wool briquets. Foam volume did not exceed one liter, and no off-gas problems were experienced.

c. Filtration Of The Incinerator Scrubber Solution

Following are the Summary And Conclusions from Unclassified Document HW-70932:

"Filtration, centrifugation, and sedimentation tests were run on three different incinerator scrubber solutions. A filtration process, using analytical filter pulp, was superior to other methods studied for removal of fly-ash from the scrubber solution. Extrapolating the experimental data indicates that the 180 liters of scrubber solution could be filtered through a precoat of the pulp, one foot in diameter and 3/4" thick, in eight minutes. Dicalite 4200 gave the second fastest filtration rate. It would require 63 minutes to filter the scrubber solution through a one-foot diameter cake.

"A bifluoride fusion experiment indicates that Dicalite does not interfere with the ammonium bifluoride process; so, if used, this cake could be processed with the incinerator ash. If the filter medium used is combustible, the filter cake could be recycled through the

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incinerator. This would be an advantage, since it would reduce the bifluoride fusion process feed. For this reason, it is felt that the use of paper pulp to filter the scrubber solution would be the best system."

d. Preparation Of Plutonium Powder By Hydriding--Delta Metal

The following Summary And Conclusions is an excerpt from Unclassified Document HW-70931.

"Fine (-325) mesh delta-stabilized plutonium powder was prepared by hydriding, hammer milling, and dehydriding. Slow hydriding between 100 and 200 C was found to favor fine powder formation. Thermal cycling during the latter part of the hydriding reaction tends to further decrease the particle size of the powder.

"Powder of higher purity could be produced by controlled hydriding and dehydriding without milling. The expected particle size distribution from slow hydriding is 50 percent -325 mesh and nearly 100 percent -100 mesh.

"Methods of controlling hydriding reaction should be further studied to establish optimum conditions for preparing powder suitable for use in powder metallurgy."

R. E. Tomlinson
Acting Manager
Research and Engineering

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

SEPTEMBER, 1961

II. ACHIEVEMENTS (Continued)

H. FINANCIAL OPERATION

1. Production Cost

Work was started in September on preparation of the Midyear Budget Review with issuance of instructions to Section Managers for the accumulation of manpower, overtime and maintenance data.

Approval was obtained from the Atomic Energy Commission for use of an incinerator startup account for the accumulation of nonproductive costs expected to arise in the first six months from startup of the incinerator facility constructed to recover plutonium from combustible contaminated materials.

The format of the monthly prototype report was revised to provide more current information on expenditures to guard against possible overruns of funds.

Accounting procedures were revised to implement changes in project costing required by modifications of OPG 1.12 - Responsibilities for Detail Design on Plant Projects.

Plant records were changed to reflect the transfer of landlord responsibilities for 271-B, 221-B, 224-B, 211-B, 291-B, and 292-B facilities from Power and General Maintenance to Purex, effective October 1, 1961.

CPD's investment in inventories at August 31, 1961, compared with budgeted balances at that date are shown below:

	<u>Balance</u> <u>8-31-61</u>	<u>Contract</u> <u>Allocation</u>	<u>Surplus</u> <u>(Deficit)</u>
<u>Inventories</u>			
Essential Materials	\$ 847	\$ 760	\$ (87)
Spare Parts & Standby	1 737	1 738	1
Special Materials	<u>120</u>	<u>65</u>	<u>(55)</u>
Gross Inventories	<u>2 704</u>	<u>2 563</u>	<u>(141)</u>
<u>Reserves</u>			
Essential Materials	56	60	(4)
Spare Parts & Standby	452	435	17
Total Reserves	<u>501</u>	<u>495</u>	<u>13</u>
<u>Net Investment</u>	<u>\$2 196</u>	<u>\$2 068</u>	<u>\$(128)</u>

Note:- Control allocation represents FY 1962 Revised Budget as the Commission has not yet established an inventory Financial Plan.

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2. General Accounting

As of August 31, 1961, costs of \$5,794,160 had been incurred by twelve active projects against authorized funds of \$11,158,000. Outstanding commitments totaled \$733,163.

During September, a directive was issued increasing authorized funds for Project CGC-821 - Project Palm - Purex to \$1,575,000.

Five Appropriation Requests totaling \$16,600 were approved, of which four were for the purchase of shop equipment in the total amount of \$13,100.

3. Personnel Accounting

Two CPD employees were called up for pre-induction physical exams in September. This appears to be the first results of the step-up in conscription for military duty.

Effective September 1, 399 CPD employees attained 15 years of accredited service with General Electric Company, thus qualifying them for such Company benefits as eligibility for supplemental payments of \$780 a year during optional retirement and disability pension when and if totally disabled.

4. Singular Cost Studies

A study of fission product costs was prepared and forwarded to HOO-AEC during the month. This cost data was developed for various products to comply with a request received from the Commission in late June, 1961.

Manager - Finance

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

SEPTEMBER--1961

II. ACHIEVEMENTS (continued)

I. RELATIONS PRACTICES OPERATION

1. Personnel Placement

All the Craft Trainees scheduled for assignment to the Chemical Processing Department have now been placed on the roll. The total number in the Department is twelve.

The Manufacturing Training Program Field Representative, W. H. Coleman, from Fort Wayne, Indiana, visited the Chemical Processing Department during the month of September. He reviewed the Assignment Supervisors' place in the success of the Manufacturing Program with each Assignment Supervisor. Mr. Coleman also reviewed the contents of the four new Manufacturing Program Assignments in the Department.

Specialist, Personnel Placement attended a Recruiter's meeting in Kennewick. The meeting was held by J. H. Holmes, J. A. Jones, and George Mullen, and covered new interviewing techniques along with a review of the Company's recruiting needs for the future. The changes which will be required by the elimination of the Engineering Program, as such, and the substituting of Department sponsored programs were also fully discussed.

RB Britton
Manager
Relations Practices

RB Britton

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CHEMICAL PROCESSING DEPARTMENT
Monthly Report

September - 1961

III. PERSONNEL ACTIVITIES

A. FORCE SUMMARY

<u>Operation</u>	<u>Monthly Salaried</u>		<u>Weekly Salaried</u>		<u>Total</u>	
	<u>8-31-61</u>	<u>9-30-61</u>	<u>8-31-61</u>	<u>9-30-61</u>	<u>8-31-61</u>	<u>9-30-61</u>
General Manager's Group	10	10	1	1	11	11
Financial	13	15	12	14	25	29
Relations Practices	5	2	6	2	11	4
Research & Engineering	64	68	27	27	91	95
Facilities Engineering	68	67	23	21	91	88
Power and General Maintenance	37	37	242	246	279	283
Production	4	5	3	4	7	9
Special Separation Processing and Auxiliaries	49	48	211	213	260	261
Purex	57	63	219	224	276	287
Finished Products	<u>54</u>	<u>52</u>	<u>249</u>	<u>251</u>	<u>303</u>	<u>303</u>
Total	<u>361</u>	<u>367</u>	<u>993</u>	<u>1 003</u>	<u>1 354</u>	<u>1 370</u>

B. PERSONNEL CHANGES

With the reorganization of Relations Practices Operation, the following employees were reassigned to other work:

John R. Cartmell - Specialist-Health, Safety & Radiation transferred to Special Separations Processing & Auxiliaries as Supervisor-Processing.

A. P. Boston - Specialist-Exempt Salary Administration transferred to Purex Operation as Supervisor-Fission Products & Monitoring.

R. W. Bryant - Specialist-Wage Administration & Benefit Plans transferred to Power and General Maintenance Operation.

M. G. Mass - Specialist-Communications transferred to Relations Operation

Wm. Watson, Jr. - Specialist-Personnel Placement was transferred to Production Operation and will continue the same functions.

Other pertinent changes include:

The transfer of C. B. Foster, Operations Practices Engineer for Purex Operation to Special Separations Processing & Auxiliaries Operation as Manager-Redox Processing.

K. M. Harmon - Manager-Process Chemistry, Research and Engineering to Hanford Laboratories Operation as Supervisor-Chemical Separations in the Chemical Research Operation.

O. F. Beaulieu - Manager-Redox Processing, Special Separations Processing & Auxiliaries Operation to Manager-Process Chemistry, Research and Engineering

O. V. Smiset - Manager-Administration, Power and General Maintenance, to Purex Operation as Operating Practices Engineer.

B. E. Clark, Jr. - Operating Practices Engineer, Purex Operation to Supervisor-Processing in Purex.

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C. TRIPS

<u>Visitor</u>	<u>To</u>	<u>Nature of Discussion</u>
<u>To Other G.E. Components</u>		
R. E. Smith	Manufacturing Services Schenectady, New York	Assistance to Hanford Program. (9/15/61)
<u>To AEC and Other AEC Contractors</u>		
C. R. Anderson	Oak Ridge, Tennessee	ASA Meeting. (9/7,8/61)
C. W. Smith	Oak Ridge, Tennessee	Shipment of fission products. (9/11,12/61)
R. E. Smith		
C. W. Smith	Martin Nuclear Company	Shipment of fission products. (9/13,14/61)
R. E. Smith	Baltimore, Maryland	
R. E. Smith	Brookhaven National Lab- oratory, Upton, New York	Fission products. (9/14/61)
A. E. Smith	Los Alamos Scientific Lab.	To attend plutonium R&D meetings. (9/26,27/61)
R. E. Tomlinson	Los Alamos, New Mexico	
A. E. Smith	The Dow Chemical Co.	Consultation on fabrication technology. (9/28/61)
R. E. Tomlinson	Rocky Flats Plant Denver, Colorado	
<u>To General Industry</u>		
L. L. McGregor	The Sheffield Corp.	Acceptance test on Sheffield gauge. (9/25-28/61)
A. W. Hildebrandt	Dayton, Ohio	

D. VISITORS

<u>From Other G.E. Components</u>		
D. L. Schwartz	Metallurgy Products Dept. Detroit, Mich.	Discuss carbide tool grade program. (9/5-8/61)
W. Coleman	Mfg. Training Field Representative	Purex plant tour. (9/11/61)
<u>From AEC and Other AEC Contractors</u>		
W. H. Regan	DRD US-AEC	Purex plant tour. (9/8/61)
W. G. Belter	Germantown, Maryland	

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From AEC and Other AEC Contractors (continued)</u>		
A. F. Perge	US-AEC Germantown, Maryland	Review plutonium recovery facilities. (9/20/61)
A. A. Weintraub	AEC-New York Operations Office	Safety Practices. (9/28/61)
J. H. Palmer	AEC-San Francisco Operations Office	Safety practices. (9/28/61)
<u>From General Industry</u>		
W. L. Shirley L. C. Widdoes	Petrolite Corporation Houston, Texas	Discuss use of electrostatic precipitators for solvent de-entrainment. (9/7/61)
R. S. Ebbert Eustace Vynne, Jr.	Di-Cor, Inc., Troy, Mich. Cascade Distributors, Seattle, Washington	Core sampling of waste tanks. (9/5 and 9/13/61)
D. Skinner	Applied Research Lab. Glendale, Calif.	Emission spectrograph servicing. (9/13/61)
Frank Carlson	Pittsburgh Testing Lab. Seattle, Washington	Core sampling of waste tanks. (9/19/61)
M. F. Slusher	Johnson's Wax Company Seattle, Washington	Decontamination chemicals. (9/20/61)
G. A. Grundman	Nooter Corporation, St. Louis, Mo.	Fabrication of process vessels. (9/26/61)
W. Rudolph P. Peterson	Seatronics, Inc. Seattle, Washington Fenwal, Inc. Ashland, Mass.	Fire-detection suppression devices for dust or solvent explosions. (9/21/61)

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IV. SAFETY AND SECURITY

Operation	Facil. Eng.	Finance	Fin. Prod.	P&GM	Purex	SSP&AO	Prod.	Rel. Prac.	Res.& Eng.	Total CPD	Yr. To Date
Disabling Injuries										0	1
Serious Accidents				1*						1	6
Medical Treatment											
Injuries	1		12	20	12	7			4	56	420
Radiation Occur.			2		2	0			1	5	155
Contam. Wounds			1**							1	17
Pu Depositions										0	6
Fires			1	1						2***	10
Security Violations	1									1	7

* The crane cab structural braces and load cable on a Northwest crawler type crane with a 60' boom suffered \$310 damage when the right gantry leg slipped suddenly in the H-frame on top of the crane cab. The sudden slack in the cables caused the boom to drop approximately 10' to the ground. No injury to personnel was involved.

** A process operator suffered a puncture wound of the left palm with a pair of scissors when cutting a piece of twine which was needed in supporting the plastic for a temporary plastic greenhouse. The scissors punctured the surgical gloves which he was wearing. There was no contamination of the wound area, but the whole body monitor showed approximately 1% of the maximum permissible body burden in the wound area.

*** Malfunction of a Berns-O-Matic torch caused flareup in 234-5 Building hood. Damage was \$10.00.

Wind driven flying embers from the burning pit in 200 West Area ignited grass and sagebrush. Damage was \$10.00

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V. REPORTS

A. PREPARED AND ISSUED

HW-69829 12, Secret, "81-C Stability - 8-23-61 to 9-5-61", dated 9-6-61, by A. E. Smith.

HW-69829 13, Unclassified, "81-C Stability - 9-6-61 to 8-13-61", dated 9-14-61, by A. E. Smith.

HW-69829 14, Secret, "81-C Stability - 9-14-61 to 9-20-61", dated 9-21-61, by A. E. Smith.

HW-69901, Unclassified, "Bird Six-inch Continuous Centrifuge", dated 9-26-61, by R. A. Ciccarelli.

HW-70148, Official Use Only, Preliminary Project Proposal - CAC-945- "New Waste Storage Tanks - Purex", dated 8-25-61, by L. W. Finch.

HW-70656, Official Use Only, "Project Palm - Purex CGC-821, Rev. #2", dated 8-25-61, by D. W. McKee.

HW-70918, Secret, "CPD Monthly Report", dated 9-21-61, by Operations Managers.

HW-70921, Secret, "Purex Plant Production Schedule", dated 9-6-61, by D. McDonald.

HW-70922, Secret, "Redox Plant Production Schedule", dated 9-6-61, by D. McDonald.

HW-70923, Secret, "UO₃ Plant Production Schedule", dated 9-6-61, by D. McDonald.

HW-70924, Secret, "234-5 Plant Production Schedule", dated 9-6-61, by D. McDonald.

HW-70925, Unclassified, "2101-M Building Space Utilization Study", dated 9-15-61, by D. W. McKee.

HW-70931, Unclassified, "Preparation of Plutonium Powder by Hydriding -- Delta Metal", dated 9-6-61, by E. R. Gilbert and M. H. Curtis.

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- HW-70932, Unclassified, "Filtration of the Incinerator Scrubber Solution", dated 9-6-61, by E. L. Conner, Jr., and H. W. Crocker.
- HW-70942, Confidential, "Comments - Proposal 1 - 93-C and 95-C Component Specifications", dated 9-5-61, by R. E. Tomlinson.
- HW-70978, Unclassified, "Off-site Plutonium Scrap Recovery - "Z" Plant Plutonium Reclamation Facility", dated 9-18-61, by D. E. Braden.
- HW-71006, Confidential, "Scheduled Shutdown - Redox Plant", dated 9-11-61, by J. H. Warren.
- HW-71010, Secret, "Statistical Statements and Associated Data for 234-5 Building Final Product Shipped during the Second Quarter of Calendar Year 1961", dated 9-11-61, by E. F. Kurtz.
- HW-71028, Secret, "Conceptual Scope Study of Waste Concentration and Nitric Acid Recovery - New Separations Plant", dated 9-22-61, by J. E. Morrissey.
- HW-71073, Secret, "Progress Report - Finished Products Fabrication Technology Operation, August, 1961", dated 9-15-61, by members of the Finished Products Fabrication Technology Operation.
- HW-71100, Secret, "Determination of the Pu 240 Content of Pu Button Neutron Counting", dated 9-26-61, by N. S. Wing.
- HW-71189, Secret, "Security Control of Pinch Bottle", dated 9-28-61, by J. H. Warren.
- HW-71193, Secret, "Data on Shipments E-41-A and E-41-B (HGE to NLO - 1-E)", dated 9-29-61, by L. M. Meeker.

B. PREPARED FOR SIGNATURE AND ISSUANCE

- HW-70917, Secret, "Production - August 1961", dated 9-1-61, by W. E. Johnson.

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VI. PATENT SUMMARY

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

INVENTOR

TITLE

NONE

P. H. Reinker

General Manager
Chemical Processing Department

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**DATE
FILMED
02/01/93**