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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT
FOR

HAN-92844 [DE]

SEPTEMBER, 1965

Compiled By
OPERATION MANAGERS

RL-SEP--755-Del.

October 22, 1965

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HANFORD ATOMIC PRODUCTS OPERATION
RICHLAND, WASHINGTON

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RL-SEP-755

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TABLE OF CONTENTS

Distribution	2
Table of Contents	3
Staff	4
I. Summary	5-6
II. Achievements	
A. Production Operation	A-1 Through A-3
B. Purex Operation	B-1 Through B-5
C. Redox Operation	C-1 Through C-3
D. Weapons Manufacturing Operation	D-1 Through D-3
E. Finance and Services Operation	E-1 Through E-4
F. Facilities Engineering Operation	F-1 Through F-3
G. Research and Engineering Operation	G-1 Through G-5
III. Personnel Activities	J-1 Through J-4
IV. Safety and Security	K-1
V. Reports Issued	L-1 Through L-3
VI. Patent Summary	Mpl

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

SEPTEMBER, 1965

I. SUMMARY

September production, as per cent of the HAPO Production Forecast (RL-GEN-23), is summarized below:

	<u>September</u>	<u>Fiscal Year To Date</u>
Separated plutonium nitrate	149	110
Separated uranium nitrate	152	109
Uranium oxide	158	119
Plutonium metal buttons	143	105
Fabricated parts	100	99

September production equaled or exceeded forecasted quantities for all products.

Purex operated satisfactorily until September 25 when it was shut down for a planned outage to make minor repairs, to inventory nuclear materials, and to rework some out-of-specification uranium and plutonium solutions.

Eighteen fission product recovery runs were made in Purex Head-End, yielding 1960 kilocuries of promethium-147 and 540 kilocuries of strontium-90.

The HAPO II-1 Cask, loaded last month with 100,000 curies of strontium-90, was released for shipment on September 10. The new HAPO 1B-3 Cask was loaded for the first time and with 430,000 curies of strontium-90, the largest load to date. At month-end this cask was ready to ship.

A continuous solvent extraction flowsheet was demonstrated in the Strontium Semiworks for the separation of cerium from rare earths.

Three neptunium purification runs were completed at Purex and yielded 2514 grams of neptunium product.

E-metal processing was discontinued at Redox on September 9 and the remainder of the month was devoted to: a neptunium removal campaign, which produced approximately 1850 grams of neptunium; an extensive nitric acid flush of process equipment, as prescribed for nuclear safety; multiple flushes of the ventilation tunnel to dissolve and recover any product entrained from vessels vented to this location; a physical inventory of nuclear materials; and maintenance repairs.

During the neptunium run at Redox, 66 curies of ruthenium were released to the atmosphere via the sand filter and ventilation stack. The activity

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RL-SEP-755

was well dispersed in the environment, however, and ground contamination was barely distinguishable above background in only a few scattered areas. The cause of the unusual breakthrough has not been determined. Investigations are continuing.

Directive No. EQT-028 authorized \$85,000 for the second In-tank Solidification Unit (Project CAC-176).

General Manager

Chemical Processing Department

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RL-SEP-755

CHEMICAL PROCESSING DEPARTMENT MONTHLY REPORT

SEPTEMBER 1965

II. ACHIEVEMENTS

A. PRODUCTION OPERATION

1. Production Statistics

a. <u>Percent of Forecast(1) Achieved</u>	<u>September</u>	<u>Fiscal Year to Date</u>
Separated plutonium nitrate	149	110
Separated uranium nitrate	152	109
Uranium oxide	158	119
Plutonium metal buttons	143	105
Fabricated parts	100	99

b. <u>Purex</u>	<u>September</u>	<u>August</u>
Uranium nitrate produced (tons)	506	459
Average production rate during operation (T/D)	23	22
Total waste loss (%)		
Plutonium	0.52	0.39
Uranium	0.23	0.33
On-line efficiency (%)	77	81

c. <u>Redox</u>		
Uranium nitrate produced (tons)	70	203
Average production rate during operation (T/D)	11	8
Total waste loss (%)		
Plutonium	0.54	0.65
Uranium	0.27	0.20
On-line efficiency (%)	22	82

d. <u>Uranium Reduction (tons)</u>		
Normal UO ₃ loaded	596	503
Enriched UO ₃ loaded	152	223
Normal UO ₃ approved for storage	596	469
Enriched UO ₃ approved for shipment	202	152
Normal UO ₃ shipped	0	0
Enriched UO ₃ shipped	253	152
Normal UNH backlog	192	253
Enriched UNH backlog	28	123

(1) RL-GEN-23, HAPO PRODUCTION FORECAST

e. Plutonium Metal Processing

September August

Reduction yield (%)	97	97
Product recovery output (KG)	83	97
Product recovery backlog (KG)	1 016	1 027
Waste disposal (grams)	326	2 366

f. Power

200-East 200-West

Raw water pumped (gpm)	9 580	5 676
Filtered water pumped (gpm)	1 058	1 089
Maximum steam generated (lbs./hr.)	180 000	93 000
Average steam generated (lbs./hr.)	145 000	67 000
Total steam generated (M lbs.)	105 847	48 869
Coal consumed (tons)	5 366	2 459

September production equaled or exceeded forecasted quantities for all products.

for *V R Chapman*
Acting Manager, Production

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

SEPTEMBER, 1965

II. ACHIEVEMENTS (Continued)

B. PUREX OPERATION

1. Operating Continuity

Purex Plant operation continued except for two brief outages for equipment replacement until the planned shutdown on September 25, 1965. Rates were maintained at a capacity factor of 2.8.

Operation of the fission product processing facilities of the Purex Head End and the Strontium Semiworks was satisfactory. There was no processing activity at B Plant. Flow restriction problems were encountered during cesium cask loading operations. One strontium cask was shipped and another loaded.

2. Processing Operations

a. Purex Processing

Uranium and plutonium product met specifications.

Three neptunium purification runs were completed yielding 2514 grams. Two shipments totaling 1277 grams of neptunium were made. One shipment totaling 391 grams of neptunium was delivered to the Plutonium Chemistry Laboratory, Research and Engineering.

The Purex Plant was shut down for approximately thirty hours on September 2 and 3, 1965 to replace a leaking LWF (high level waste concentrator feed) jumper and the HAF (codecontamination column feed) pump and discharge jumper assembly. On September 10, 1965 the codecontamination cycle was shut down for twenty-five minutes to replace the leaking HSR (HS column scrub recycle to the HA column) jumper. Except for these two outages the plant operated continuously with two dissolvers at a capacity factor rate of 2.8 until September 25, 1965 when it was shut down for minor repairs, a cleanout inventory, and rework of out-of-specification uranium and plutonium.

The A3 multipurpose dissolver operability tests and necessary cold side revisions were completed and metal was charged for initial dissolution experience. It was necessary to replace a high suction lift jet because of marginal performance.

Preparatory work for replacement of the L11 (plutonium rework transfer) vessel by construction forces was started.

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b. Purex Head End Processing

The Purex Head End fission product recovery equipment operated continuously and processed all of the 1WW (concentrated high level waste) produced by the decreased Purex Plant rates. An estimated 1960 kilocuries of promethium-147 (two-year aged) and 540 kilocuries of strontium-90 were recovered in eighteen runs. Evaluation of the leach tests of the solids discarded from the high level waste feed solution are incomplete but generally indicate that the initial nitric acid leach is much more effective than the subsequent caustic-tartrate leach.

c. B Plant Processing

No processing activity at B Plant.

d. Strontium Semiworks Processing

Three successful test runs were completed at the Strontium Semiworks, using fission product crude solution (B Plant feed) from the 003 CR Tank to demonstrate a continuous solvent extraction flowsheet for the separation of cerium from the rare earths. The three runs consisted of: a) decontamination of the cerium and rare earths from strontium and inert contaminants, iron and lead; b) a silver-catalyzed persulfate oxidation and extraction of the cerium from the rare earths; and c) decontamination of the rare earth product solution from the sulfate introduced in the persulfate test. Measured instantaneous waste losses averaged less than five percent in each test. However, the material balances have accounted for only eighty-five percent of the product. The tests have shown the advantages of continuous column processing over earlier batch contacts and demonstrated the feasibility of this equipment approach for B Plant, Phase III processing. A four-day column operation was used to decontaminate the Strontium Semiworks organic inventory after the second test run.

The forty-gallon cask containing about 14,000 curies of promethium-147 resulting from the Separations Chemistry ion exchange purification run was transferred to Battelle Northwest Laboratories. The HAPO-II-1 cask, loaded with one hundred kilocuries of strontium-90 late last month, was released for shipment to Quehanna on September 10, 1965. The new HAPO-1B-3 cask was loaded for the first time with 430 kilocuries of strontium-90, the largest load obtained to date, and is ready for shipment at month's end.

e. Cesium Processing

A pressure test of the inner liner of cesium cask 46 was made to verify the integrity of the inner liner (product container) when higher-than-normal surface radiation readings were measured. The two loaded casks were released for shipment when tests revealed no evidence of a leak. Cesium casks 47 and 48 were received on site September 17, 1965, and loading was started the following day. Flow restrictions through the screened outlet line within the first cask were immediately encountered. Examination of the screen showed a fine white solid which was thought to be either DeCalso resin fines or a precipitate resulting from the aluminum contamination in the Tank 103-C feed and low pH conditions within the DeCalso bed. The second cask was pretreated with two column volumes of dilute (one molar) sodium hydroxide after which loading proceeded with minimal flow problems. However, effluent losses, which were routed back to the feed tank throughout the loading cycle, were abnormally

high (fifty percent) and the estimated cask load after one hundred percent break-through is lower than normal. The Tank 103-C cesium feed material was resampled to further define its condition and loading characteristics and to determine the effect of the addition of coating waste from a broken line in March, 1965. The aluminum content of the Tank 103-C is about threefold higher now than before the coating waste addition. A small increase in pH and a fifteen percent increase in sodium concentration were also measured. Analyses of samples drawn from the top and bottom of the tank contents indicate that extensive mixing has occurred within the tank due to the circulation pumping during cask loadings. Samples of Tanks 105-C and 101-A were submitted to Battelle-Northwest Laboratories for scouting an alternate feed source.

f. Waste Management

The In-Tank Waste Solidification unit reclaimed 174,000 gallons of non-boiling waste storage space. Two electrical immersion heaters were installed and put into service on September 21 and 22, 1965. Evaluation of the added evaporation contributed by the immersion heaters has not been made due to the off-gas filter restriction problems which have required frequent shutdowns after only several hours of operation. Core sampling of the filter media revealed extensive degradation of the Fiberglas but very little foreign material. The two 200-West Area tanks, 102-T and 103-T, allotted for waste storage have been filled. The routing of coating waste to Tank 112-BY, made available by the In-Tank Waste Solidification unit, has started.

190,000 gallons of Tank 101-AX contents were routed to Tank 103-AX for boiloff.

3. Equipment Experience

One Purex pulse generator transmission unit became noisy and was removed from service. Bearings, coupling, shaft and seals were replaced in the machine and the unit was returned to service.

The Purex chemical makeup vessel vent blower failed due to acid corrosion. The failed blower was made of carbon steel. The replacement unit was a new stainless steel blower from Spare Equipment.

Overhaul of the Purex Number One instrument air compressor was completed. Bearings, sleeves, and seals in the compressor unit and the oil pump in the gear box were replaced. This work was a preventive maintenance program item.

The Purex Number One canyon exhaust fan failed because of a defective outboard bearing in the blower. A new bearing and sleeve were installed and the unit was returned to service.

Major repairs to the UO₃ recovered acid pump, located in the Purex 203-A Area, were completed. Bearings, shaft, seals, and coupling were replaced. This work was a preventive maintenance program item.

The Purex 1BXF (partition cycle feed) rotameter jumper developed a leak at the wall head in the canyon. The jumper was decontaminated and repaired.

The existing seventy-five gallon-per-minute transfer jet on the Purex Head End Tank E3 (waste transfer to underground storage) was replaced with a twenty-five gallon-per-minute jet to eliminate waste solution back-up into Tank F16 (waste denitration and neutralization tank.)

3. Equipment Experience (Continued)

Re-establishment of the Purex coating waste transfer route from Tank 102-C to Tank 103-T was completed after the existing pump plugged at the suction inlet. A second pump was installed in the Tank 102-C sluice pit when high radiation readings prevented immediate removal of the failed pump.

The failed P-7 (HA column spare feed pump) at the Strontium Semiworks was removed after mechanical sawing separated the impacted electrical head from the pump jumper. The use of a television camera facilitated both the removal and subsequent installation of the new pump. The failed P-16 organic feed pump was replaced without incident prior to the start of the promethium test runs.

The remaining work on transfer lines connecting the Tank 103-A pump pit and Tank 105-A sluice pit, water lines for sluicing Tank 105-A, and the line from the new pump pit of Tank 105-A to Tank 103-A has been completed. The bulge detectors in Tank 105-A have shown no change in the tank bottom elevation. The radiation readings in the laterals beneath Tank 105-A remain unchanged.

The replacement of the 2300 volt power cables at B Plant is progressing according to schedule. The work is eighty percent complete and is being accomplished by the J. A. Jones Company.

The 241-A Number One vessel vent fan motor was replaced because of defective bearings. The removed motor was repaired and will be used as a spare.

The Number Two electrical heater bank of the In-Tank Waste Solidification unit failed and was replaced. The failed heater bank was found to have an open element. It will be repaired and used as a spare.

The Fiberglas filter in the In-Tank Waste Solidification unit off-gas system is being replaced with the existing spare. Continued high pressure drop across the filter made the replacement necessary.

4. Radiation Experience

Iodine 131 emission was 1.43 curies for the month.

Burials of the failed Purex process vessel vent filter and a box of failed jumpers were completed with good contamination control.

Emptying, flushing, and water sealing the A Cell tanks at the Strontium Semiworks prior to the P-7 pump removal resulted in significantly lower personnel exposure levels (four- to five-fold) and enabled longer working times. Contamination control was good.

5. Analytical Experience

Use of the Remote Analytical Cave progressed to a routine shift operation during September, 1965. Bulk samples were taken on all Purex Head End

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RL-SEP-755 DEL

fission product recovery sampling points. Material balances were found to be much improved when compared to data from prior fission product recovery runs using the normal Gilmont sampling systems.

Calibration data and operating parameters are currently being obtained on the X-Ray fluorescence spectrometer. Calibrations for thorium in a one molar nitric acid matrix, and silver and strontium in a water matrix have been completed. Present calibration efforts are being directed toward the determination of thorium in 0.001 pounds per gallon to 3.56 pounds per gallon concentrations. Nine process sampling points are being developed. Development of silver and cerium calibrations in Strontium Semiworks and B Plant sample matrices, and neptunium, uranium, and plutonium product calibrations are scheduled.

Cleanup and service system checks have been started on the laboratory in the B Plant chemical makeup area. Studies are underway to determine possible uses, staffing problems, and work load capacity.

Manager-Purex

WM Harty:MLM:gt

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RL-SEP-755

CHEMICAL PROCESSING DEPARTMENT MONTHLY REPORT

SEPTEMBER 1965

II. ACHIEVEMENTS (Continued)

C. REDOX OPERATION

1. Operating Continuity

E-metal processing in the Redox plant was discontinued on September 9. During the balance of the month: 1) a neptunium recovery run was conducted; 2) a concentrated nitric acid flush of process equipment was made to satisfy nuclear safety requirements; 3) a dilute acid flush of the canyon wind tunnel was conducted; 4) a physical inventory of SS material was taken; and 5) shutdown-type plant maintenance was performed. Plant performance at the time of shutdown was excellent, with full rate being achieved and both uranium and plutonium products in specification.

The Uranium Oxide plant operated satisfactorily throughout the month and the production of both depleted and enriched uranium oxide exceeded that expected.

2. Processing Operations

a. Redox Processing

The processing of E-metal was terminated on September 9, preparatory to the performance of a neptunium recovery campaign and completion of a 57 percent nitric acid flush of the process equipment for nuclear criticality control. Operating efficiency during the production run was 76 percent at an average rate of 101 percent. Processing was interrupted for 48 hours due to the loss of heat transfer capability in the G-3 organic still. Normal operation was restored after a weak acid boil-up in the G-3 vessel.

Collection and consolidation of the in-plant neptunium inventory was completed on September 12 and the solvent extraction phase of the campaign began on September 13. Following two successive pre-cycle treatments, the initial pass under acid-deficient conditions for partition from uranium and plutonium, and the second on an acid flowsheet for fission product decontamination, the neptunium was processed through three additional decontamination cycles to final concentration and loadout on September 22. Approximately 1850 grams of neptunium were recovered.

Concurrent with the final stages of the neptunium campaign, water flushes of the process equipment were made to precede extensive flushing with 57 percent nitric acid. Product recoveries from

this source were nominal. At month-end, weak acid solutions were being routed to the canyon ventilation tunnel for dissolution and recovery of any product entrained from vessels vented to this location.

b. Uranium Oxide Processing

Processing operations were satisfactory throughout the month and the expected production was exceeded. On-line efficiencies were 89 and 71 percent for enriched and depleted uranium oxide, respectively. Plugging of the E-metal feed system on two occasions, loss of the X-19 and X-30 calciner feed pumps, plus two planned steam outages and one electrical outage, combined to reduce the average on-line time. However, both the enriched and depleted metal feed inventories were near minimum at month-end.

3. Mechanical Experience

a. Redox Plant

There were no process outages related to mechanical equipment problems this month and a 100 percent mechanical efficiency was achieved.

On 9-14-65 the agitator in the H-1 feed preparation tank failed and was replaced with a repaired unit. This pump had been in operation for 33 months. No lost processing time resulted from the change-out.

A cooling coil leak in the 2D column feed tank (F-1) was detected on 9-26-65. At month-end, preparations were being made to replace the tank with a repaired unit.

b. Uranium Oxide Plant

The M-calciner was returned to service on 9-13-65 and operation to date has been satisfactory. This unit was taken out of service on 8-4-65 for repairs to the jack shafts (2) which were bent slightly at the coupling flanges.

Both X-30 calciner feed pumps failed within a one-hour period on 9-10-65. One unit suffered a pump bearing failure and the other unit developed excessive leakage around the pump shaft. Both units were repaired and returned to service in approximately eight hours.

On 9-1-65, the L-cell calciner off-gas scrubber failed due to corrosion at the welded joints. The failed unit, which had been in operation since August 1962, was subsequently replaced with a new spare.

4. Waste Handling and Decontamination

There were no significant changes in the radiation readings under the 107, 108 and 109-SX underground waste storage tanks during the month

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RL-SEP-755

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and no measurable loss of liquid was detected.

The installation of a reflux condenser on the 108-SX waste tank was completed this month. Reflux capability will permit accurate liquid material balance calculations on the 108-SX tank, thus proving or disproving that leakage from the tank does, in fact, exist.

Equipment valued at approximately \$33,000 was received from customers for decontamination, repair, inspection or burial during the month. Equipment valued at approximately \$77,000 was returned to customers, representing a savings of approximately \$61,000, based on the cost of new equipment.

5. Radiation Experience

During the recently completed neptunium removal campaign, a total of 20 curies of Ru-103 and 46 curies of RuRh-106 was released to the atmosphere via the Redox sand filter and ventilation stack. This unusual emission occurred during a 72-hour period ending at 1300 on 9-20-65. Extensive radiation surveys conducted in the immediate Redox plant area, the 200-West Area, and Hanford reservation environs, disclosed no significant increase in background radiation levels or contamination. Although no definite cause for this release has as yet been established, the large inventory of ruthenium present in the feed stream and the combined use of persulfate and bismuthate oxidants may be the primary contributing factors. Investigation of the mechanism which caused the unusual breakthrough is continuing.

6. Analytical Experience

The Redox Analytical Laboratory provided non-routine analytical support to its various customers which included, but was not limited to: 1) priority gamma isotopic analyses for all iodine isotopes in four special air samples submitted by Battelle-Northwest Laboratory; 2) strontium-90 analyses on a large number of soil core samples for the Geological and Geochemical Research Laboratory; 3) special thorium-228 and thorium-230 analyses on a series of samples submitted by the Fuels Preparation Laboratory, IPD, in support of their quality control program for thorium fuel element fabrication; 4) control analyses on an americium-241 purification run conducted by the Separations Chemistry Laboratory, CPD; 5) special gamma isotopic analyses of air samples taken from the Redox plant stack monitors which identified an unusually high emission of radioactivity as Ru-103 and RuRh-106.

RNM-Cullough
Manager - Redox

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

SEPTEMBER 1965

II. ACHIEVEMENTS (Continued)

D. WEAPONS MANUFACTURING OPERATION

1. Operating Continuity

The fabrication of Model 88-C weapon components was without significant interruption during the month. The production of unfabricated plutonium also was without particular delay. Recovery operations were curtailed by repairs to the slag and crucible dissolvers and by the rebuilding of the incinerator furnace. The waste-treatment facilities and the americium-recovery equipment performed satisfactorily.

2. Processing Operations

a. Plutonium Fabrication

Information on plutonium fabrication activities is presented in document RL-SEP-766 (Atomic Weapon Data).

b. Plutonium Reduction

Button line activity was normal during the month. High gamma-ratio material from Redox was blended at low rates, and button quality was not adversely affected, but a slight increase in radiation readings was observed.

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c. Non-Defense Plutonium Processing

The following shipments of non-defense plutonium were made during the month:

400 grams of Pu nitrate to GE-Vallejos
25 kilograms of Pu oxide to Euratom-Karlsruhe

d. Plutonium Reclamation

Eighty-two (82) kilograms of plutonium, as nitrate, were delivered to the button line from the recovery facilities during the month.

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The incinerator remained out of service, but leaching operations were continued. Nineteen (19) boxes were processed through this facility.

Three hundred and ninety-four (394) cans, containing approximately 13.5 kilograms of plutonium, were processed through the slag and crucible dissolvers during the month.

One hundred and forty-one (141) grams of plutonium were returned to the main process stream from 50,185 liters of aqueous waste, which were processed through the waste-treatment facility. Also, 8.8 grams of americium were recovered and stored for further processing.

Cleanout of the Recuplex RB Hood vessels was delayed by the need to flush the W-2 Column in the waste-treatment facility.

Hood 227 (former leaching hood in 234-5 Building) has been prepared for the recovery of plutonium from a number of polystyrene cubes supplied by the Battelle-Northwest Critical Mass Laboratory. Work is to begin early next month.

3. Mechanical Performance

Equipment in the fabrication and inspection areas performed well, with the only significant item being the replacement of the spindle bearings in both of the Gorton lathes in Hood HC-24-B.

Button-line equipment performance was satisfactory. Principal problems involved low vacuum on the drum filter and the fluorinator.

Operation of the recovery equipment was satisfactory, except for the failure of the operating mechanisms of the ball valves on the loading chutes of the dissolvers and the failure of numerous pumps (four buried, nine rebuilt). Also, it was necessary to make one canyon entry to adjust the tension to the trolley drive wheels of the hoist.

Minor Construction forces are on schedule in the rebuilding of the incinerator furnace.

The emission spectrograph and both of the mass spectrographs operated satisfactorily during the month.

4. Radiation Experience

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

There were no cases of potential plutonium contamination.

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RL-SEP-755

5. Analytical Experience

Number of samples received	3,591
Number of determinations	24,432

New critical mass specifications for the analytical laboratory (RL-SEP-324, by R. J. Sloat) have been issued. A review of procedures has been completed and new limits posted during the month.

Manager
Weapons Manufacturing

SG Smolen:ap

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

SEPTEMBER, 1965

II. ACHIEVEMENTS (Continued)

E. FINANCE AND SERVICES OPERATION

1. Production Cost Accounting

At AEC request, an information meeting was held with R. Tolman, RLOO-AEC Budgets Division, and Messrs, W. Lennemen and T. Yakimchick of the Washington AEC Office. Representatives of CPD's Financial Operation explained the reasons the department was requiring approximately \$1.2 million additional O2 Production funds over the initial financial plan.

A change in work order procedure was published abolishing the use of cross orders for work ordered by CPD from other departments. Cross Reference Orders will be used in the future. A programming conflict between the multiple IME rate and cross order programs developed resulting in application of improper IME rates in some cases. The use of cross reference orders will rectify this situation.

Billing was effected for September Fission Product shipments:

	<u>Customer</u>
Pm-147 - 14,000 Curies	BNW
SR-90 - 100,000 "	Martin Marietta
Cs-137 - 68,000 "	ORNL

2. General and Tax Accounting

As of September 30, 1965 there were thirteen active projects. Following is a summary of current status of projects:

	<u>In Thousands</u>
Total Authorized Funds	\$3,161
Total Cost to Date	2,225
Commitments and Open Work Releases	343
Unencumbered Balance	593
Costs Charged During September, 1965	204

During September, two work authorities were received from the AEC: Directive No. AEC-244, Work Authority No. 2, Project CAC-144, Waste Fractionization - B-Plant, for increase in funds to new total of \$65,000; Directive No. EQT-028, Work Authority No. 1, Project CAC-176, Second In-Tank Waste Solidification System - 200 East Area, authorized \$5,500.

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There were no construction completion and cost closing statements issued during September.

All new Appropriation Requests were held up pending release of total FY 1966 Equipment funds to the department.

3. Business Programs

On September 29, the AEC complex optimization task force met in the 700 Area with members from Union Carbide, Oak Ridge; DuPont, Savannah River; USAEC, Washington; and General Electric, HAPO. The task force membership was expanded from seven members to eight members to include a CPD representative.

4. Business Information Systems

Forms Control Activities for September include:

Forms new	4
Forms printed in the 700 Area	9
Forms duplicated in 200 Area	35
Forms working copies reviewed	71

The IBM 1050 Communication equipment has been received and installed in Redox. The new equipment will permit the transmission and transcribing of analytical sample data between the Redox Laboratory and the Redox Processing Building. During the next few weeks, the new system will run parallel to the existing system in order to allow employee familiarization and to determine the accuracy of machine output.

A meeting was attended at Columbia Basin College to discuss mutual data processing problems. The attendants represented a community cross section of people involved in Electronic Data Processing and included public accounting, banking and Hanford. The primary purpose of the meeting was for CBC officials to try to obtain industry guidance for their data processing curriculum.

In order to more closely control charges made by the Computer Sciences Corp., a ledger has been established on individual CPD data processing application. Their monthly billings are being recorded and watched closely. It is also understood from CSC that their computer time rates will be increased by 20 percent. The increase is primarily caused by the fact that the rate first selected is not liquidating CSC's total cost.

5. Audit and Contract Reimbursement

Field work was completed and a formal audit report was issued covering our examination of overtime lunch administration and control. In our opinion, the activities audited were generally satisfactory.

A formal audit report was issued covering our findings and recommendations relating to an audit of Protective Clothing and Equipment. Suggestions for improvement in controls and accountability were referred to Section Managers.

A formal report was issued covering our examination of tuition refunds applicable to FY 1965. One overpayment in the amount of \$7.50 was noted and prior to the close of the audit, repayment was made.

6. Purchasing

Purchase Orders and Contracts Placed (including Alterations):

	<u>No.</u>	<u>Value</u>
Formal Orders	320	\$476,087
Verbal Orders	144	7,996
Essential Materials Orders	<u>11</u>	<u>121,699</u>
Total	475	\$605,782

<u>No.</u>	<u>Competitive</u>	<u>Vendor</u>	<u>Material</u>	<u>Price</u>	<u>Date</u>
S6N-675-35420		Tube Distr. Calif. Inc.	Tubing	\$149,253	9-02-65
S6N-666-35518		H.M. Harper Company	Pipe	38,107	9-08-65
S6L-640-30995		Shell Chemical	Methyl Hexone	52,930	9-17-65
S6L-675-35635		K-F Products	Blocks, sub-assbly.	54,299	9-20-65
S6N-675-35667		Fansteel Met. Corp.	Tube Bundles	25,020	9-27-65

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RL-SEP-755 [REDACTED]

7. Administrative Services

The summer program of weed control spraying of 2-4-D has been completed. Fall and winter soil sterilization for the elimination of weed growth is scheduled to start in November. Trysoen - 200 will be applied to areas where major problems in weed control have been experienced.

The 2709-W annex has been sold and the successful bidder has initiated removal activities. Completion of removal is anticipated by October 30.

Reviews of other department or contractor occupancy in the 200 Areas have been completed and liquidation of appropriate charges are, in effect, utilizing standard rates established in July, 1965.

R. H. Connell

Manager - Finance

[REDACTED]

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

SEPTEMBER 1965

II. ACHIEVEMENTS (continued)

F. FACILITIES ENGINEERING OPERATION

1. Purex

241-BY Tank Farm

The stack filter instrumentation system for the 241-BY Tank Farm was assembled and tested. A 4,904 disintegrations/minute Cs¹³⁷ sample was used in the detector and the count rate found to be 275 counts/minute with a 5 counts/minute background. This result is more than adequate for the 241-BY installation.

Multipurpose Dissolver Development

The new "center trunnion" short canister was used successfully in dumping 31 canister loads (434 elements) of fuel elements into a 6 $\frac{1}{4}$ -inch annulus. This equipment has several advantages over the "bail-type" short canister and has been recommended for plant application. The segmented-type "center trunnion" canister was eliminated as unsatisfactory for random dumping. Drawings for the dissolver machine are being revised to accept the latest canister design.

Irradiated Metal Movement

The complete system for moving irradiated uranium metal from the 100 Areas to Purex Plant and the mechanics of the in-Purex processing steps are being evaluated. The study is planned to determine whether there are any capacity factor limitations in the entire system which would compromise current expansion plans.

CAC-176-Second In-tank Waste Solidification System - 200-E Area

This project was authorized \$85,000 by Directive No. EQT-028, dated September 3.

2. Redox

Sludge Removal (D-14 to H-4)

A new jumper system was installed for jetting from D-14 Concentrator to H-4 Oxidizer. This replaces a previous 3-step system.

Pump Bearing Repair

Glass bearings were installed in three X-19 pumps for use in 224-U Building (Uranium Trioxide Plant). By careful machining

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F-1

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RL-SEP-755

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of bearings and pumps, the bearings were made inter-changeable and of one size. This development reduces the spare parts stock from ten sizes to one.

3. Weapons Manufacturing

Triple ASP Unit - 234-5 Laboratory

Two of the three ASP (Alpha Simpson Proportional) amplifiers have been modified to incorporate an improved input protection circuit. A very notable performance improvement resulted from the better control of high voltage circuitry. The third amplifier is being modified as soon as possible.

Critical Incident Alarms

The critical incident alarm systems in 234-5 Building were tested. One failed to sound because of a bad relay. An over-all audit of the system is planned.

Estimation of Plutonium Build-up - 242-Z Building

A gamma scan was made of all process vessels in 242-Z Bldg. to determine possible build-up of plutonium. Because of an indicated excess, the W-2 Column was scrubbed (twice) and flushed once with readings at each step. These actions did not remove any appreciable plutonium from the column, but did reduce the zirconium-niobium levels enough to allow better definition. Further readings are planned at 2-week intervals.

236-Z Building

All drawings and procurement were completed for the new arrangement of Dissolvers 04, 06, and 08. Installation was started. Detail design was completed for new skull dissolvers for Miscellaneous Treatment Glove Box No. 2, and for a Butler-type building for PR-RC can storage.

Ion Exchange Facility

Detail design was essentially complete for the HA-47 Glove Box and equipment for the HA-46 Ion Exchange Facility.

Plutonium Buy-back Program

The Plutonium buy-back design criteria document (RL-SEP-590) was revised and forwarded to the Commission for approval. Design was completed on the containers required for in-plant storage of plutonium solutions. The project proposal is being circulated for approvals.

Analytical Laboratory

Installation of the sample storage glove box has been completed and the glove box put into service. Detail design was completed for new replacement sinks for the decontamination hoods in Room No. 143. Also, detail design was completed for the exhaust ventilation ducts serving glove boxes in Rooms No. 185, 186, and 189.

4. General

Design criteria were prepared for both the fission waste container storage facility and the container handling before processing in Cell 15. Scope of the storage facility was reduced to a "minimum capacity" storage in 221-U Building, i.e. Cell 4 for storage and Cell 5 for heat exchange.

Cas Metal Arc Welding Process

The second phase of the evaluation program for gas metal arc welding has been initiated. The work planned is scheduled for completion by mid-March 1966. Information gained will establish whether this highly efficient and economical process can produce welds of sufficient resistance for Chemical Processing Department purposes.

Spare Parts Management System

The operating manual for the spare parts management system has been issued to all plant and maintenance managers. Individual explanations were given and included control charts showing the status of facilities for which each is responsible. These charts are to be brought up-to-date quarterly and supplied to all managers using them.

200-East Area Steam Needs

Detailed analysis has been completed of expected demand for steam in 200-E Area at anticipated future production rates and conditions. The indicated demand would require the capacity rate operation of all steam producing equipment in that area for the eight cooler months. Failure of steam production or steam distribution equipment will cause some curtailment of separations activity until repair can be accomplished.

Shop Fabrication

Thirty-two (32) jumpers were fabricated during the month, of which eleven (11) were done on an emergency basis.

HPSHaw/WWC/alr

Manager, Facilities Engineering

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RL-SEP-755

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

SEPTEMBER 1965

II. ACHIEVEMENTS (Continued)

G. RESEARCH AND ENGINEERING OPERATION

1. Separations Process Engineering

Redox

a. Solids Dissolution F-7 Tank

During July 1965, the 1A Column Feed Tank F-7 was flushed with a solution of 20% HNO_3 - 6% NH_4F - 2% $\text{Na}_2\text{Cr}_2\text{O}_7$ - 1.6% H_3BO_3 to dissolve a hold-up of intermetallic solids (primarily uranium trisilicide). The flush failed to dissolve the entire solids inventory; however, it did recover 417 grams of plutonium and 354 pounds of uranium. A second flush of the same type during September dissolved the remaining 108 pounds of uranium and 300 grams of plutonium.

b. Ruthenium Emission

In the recent neptunium recovery campaign, several curies of volatilized ruthenium was not retained in the sand filter and was released to the atmosphere. The flowsheet for neptunium recovery campaigns at the Redox Plant includes solvent-extraction decontamination of neptunium, after its partitioning from uranium and plutonium. To assist in the decontamination from ruthenium, the product streams from the third and fourth decontamination cycles are treated with ozone. The ozonation operation includes the addition of an oxidizing agent, normally sodium persulfate, and sparging of the boiling solution with one per cent ozone. Volatilized ruthenium is routed to the sand filter; historically, the sand filter removes greater than 99.9 per cent of the input ruthenium, and ruthenium emissions to the atmosphere from the Redox stack have been less than 0.3 curies per day during previous neptunium campaigns. In the recent campaign, however, a total of 20 curies of Ru-103 and 46 curies of Ru-106 was emitted from the stack over a three-day period. The principal difference between this and previous campaigns was the use of sodium bismuthate, in addition to potassium persulfate, during the ozonation operation in the E-2 vessel. Investigation of the mechanism for the abnormal release is continuing.

c. 57 Per Cent Acid Flush

A total of 1,210 grams of plutonium was recovered from the scheduled 57 per cent nitric acid flush of the process vessels and solvent extraction columns during the month. Of this total, 451 grams of plutonium were recovered from the 1A partition cycle column and overflow line and 595 grams were recovered from the D-14 backcycle concentrator. These data indicate no unusual hold-up of plutonium in the process equipment.

2. Fission Products Process Engineering

a. In-Tank Solidification

Two prototype immersion heater units were installed in Tank 101-BY and placed in operation following operability testing of the units. One unit is a 240 KW Watlow heater and the other is a 120 KW General Electric heater. Both of the prototype heaters were strengthened before installation to avoid the possibility of structural failure encountered with the original circulator heater. When placed in operation the temperature and boil-off rate of Tank 101-BY slowly increased. Initial amperage readings indicated that both units were operating at rated power.

A very gradual increase in the ITS filter pressure drop has been observed during the operating period starting in July. During shutdown in mid-September for installation of the prototype immersion heaters the filter was deep flushed with 0.5 molar sodium hydroxide. Activity levels in the filter were substantially reduced. When the unit was restarted the filter pressure drop was normal, but within a few days it increased to the point that a reduction in air flow was required. A shutdown and deep water flush of the filter restored the pressure drop to normal, but it again rapidly increased after startup. Increasing the hot air bleed to the filter has had no beneficial effect. The operation of the immersion heaters does not appear to be a contributing factor. No unusual increase in filter radiation level has occurred with the increased pressure drop.

b. Fission Products Recovery

The leaching of fission products from solids in the denitrated Purex Acid Waste was studied further during the month. The solids were leached with 4 molar nitric acid followed by 2 molar sodium hydroxide - 0.1 molar tartrate. The leaching was done in an agitated tank rather than in the centrifuge bowl as was done in earlier tests of solids leaching with nitric acid only. (See the July report.) Based on data from ten runs the additional leach step using sodium hydroxide-tartrate was not

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RL-SEP-755

123

significantly more effective than a single acid leach. Some additional Zr-Nb-95 was noted with the sodium hydroxide - tartrate leach solution however, which may not be desirable.

Some difficulty has been encountered in loading cesium onto the alumino-silicate resin in the cesium shipping casks. During the last loadout, cask resins adsorbed approximately 30 per cent less cesium than normal. The lower loading of the casks is attributed to approximately 10 per cent inadvertent dilution of Tank 103-C feed material with coating waste. Increased pH of the feed solution and addition of sodium and aluminum are known to adversely affect resin loading capacity. Prior to the coating waste addition, the cesium feed composition was 4.35 molar sodium, 0.06 molar aluminum, 2.16 curies/liter cesium-137 and pH 12.8. After dilution with coating waste the composition is 4.8 molar sodium, 0.22 molar aluminum, 1.89 curies/liter cesium-137 and pH 13. The presence of increased aluminum concentrations in the cesium feed tank also presents an operability problem during cask loadings. Aluminum has been shown to precipitate and plug ion exchange beds in the laboratory during loading onto ammonium-based exchanger. The pH of the feed solution is decreased due to the exchange of sodium and cesium with ammonium ion resulting in precipitation of aluminum. The plugging problem can be avoided by displacing ammonium ion with sodium ion prior to cask loading.

A continuous D2EHPA (di-(2-ethylhexyl) phosphoric acid) solvent extraction flowsheet for the removal of iron, lead, strontium and other fission products from cerium and the rare earths was tested at the Strontium Semiworks. Cerium and rare earths were extracted into the solvent in the extraction column at pH 2.5 to 3.0 from an aqueous phase containing HEDTA chelating agent for metal ion complexing and glycolic acid as a buffer. An aqueous scrub of HEDTA and glycolic acid at pH 2.0 was used to improve decontamination. The cerium and rare earths were stripped in a second column with nitric acid. Decontamination factors of 125, >35, 20, >7 and 3.5 were attained for lead, iron, zirconium-niobium, ruthenium and strontium, respectively. The flowsheet was operated at a pH higher than intended because of a bias in the plant pH meter readings. Strontium decontamination was poor and instantaneous cerium-rare earth losses were approximately 10 per cent to the extraction waste. Operation of the flowsheet at pH 2.0 was shown later to decrease losses and increase the strontium decontamination factor to 50.

3. Plutonium Process Engineering

a. Plutonium Button Storage Test

A test was performed to determine if the placement of plutonium metal in aluminum cans with screw top lids prior to sealing in plastic would prevent or substantially

RL-SEP-755

reduce corrosion during storage. The metal is currently sealed directly in plastic; the plastic undergoes radiogenic degradation, producing gases that react with the metal. A series of 10 plutonium metal "buttons" were alternately sealed out of the production line, either in direct contact with plastic or in aluminum cans sealed in plastic. The 10 buttons were then stored for 95 days. During storage, one button in each type of storage package was brushed and reweighed at regular intervals. All buttons were brushed and reweighed at the end of the test. The conclusion drawn from the test data is that the packaging of plutonium metal buttons in aluminum cans with screw top lids, prior to sealing in plastic envelopes, would not substantially reduce the amount of metal lost due to corrosion. If reaction with water is the primary corrosion mechanism, involved procedures would be required to eliminate the small amount of moisture required to produce the corrosion encountered. Approximately 0.2 gram of water could be easily occluded in the metal after pickling or in the packaging used.

b. Plutonium Build-Up in the Waste Treatment Facility

Gamma counting of the Waste Treatment Facility vessels indicates that the static DBBP solvent extraction column (W-2) may be subject to a long-term build-up of plutonium, which is not removed by either normal or special strip procedures.

The facility was shut down when the initial gamma monitoring indicated a possible hold-up of as much as 1,500 grams of plutonium as compared with an administrative limit of 400 grams. The W-2 vessel is geometrically favorable, but other vessels downstream are not. This plutonium may exist as solids and/or be absorbed in the column packing (1/2-inch, 4 per cent borated polyethylene Raschig rings). Special strip solutions removed only small amounts (50, 35, and 30 grams) of plutonium; they did, however, remove other radionuclides that interfered with plutonium measurement such that the estimates of maximum plutonium content could be revised downward to the range of 300-500 grams. Operation of the column is being performed on a test basis for a 3-month period, using the normal 0.1 M HF strip. During this test period, the column will be gamma monitored every two weeks.

4. Separations Chemistry Laboratory

a. Citric Acid Oxidation

It appears from the current data that the most effective method for destroying citric acid by the peroxide method now in use is to add just enough nitric acid to maintain

the citric acid in the un-ionized state. With the concentrations of Na⁺ and Sr⁺⁺ now in the feed, this amounts to a .15 M nitric acid solution. Up to 2 M nitric acid may be used without pressurization caused by the rapid decomposition of nitrate; however, it appears that the excess nitric acid destroys the peroxide before oxidation is achieved.

Exact acid conditions cannot be given at this time because of peroxide interferences in the analytical method used to determine the citric acid concentrations. All samples from previous experiments are being rerun using a modified analytical procedure.

b. Analytical Improvement

Evaluation of Silicon Standard

A set of four silicon standards (PuO₂ matrix) supplied by Los Alamos has been run by the spectrographic carrier distillation method and by a Los Alamos colorimetric molybdenum method. Both techniques have given values which are in the expected ranges and essentially in agreement with each other. Investigation is continuing into the reasons why the analysis of plutonium metal does not result in more realistic values for silicon as compared with the experience with the oxide.

5. Plutonium Chemistry Laboratory

a. Recovery of PuO₂-Polystyrene Cubes

A grinding technique for reducing the PuO₂-polystyrene cubes (2" x 2" x 2") to $\approx$ 20 mesh powder was demonstrated in the laboratory.

Dissolution in chloroform was fairly slow when chunks of polystyrene were dissolved. Dissolution could be speeded up if the polystyrene were ground to a powder. The procedure developed in the laboratory was to break up the polystyrene cubes into $\approx$ 8 pieces with a hammer. These fragments were then fed into a laboratory grinding mill. These steps proceeded with no operational problems.

R. E. Toulminson

Manager
Research and Engineering

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

SEPTEMBER, 1965

III. PERSONNEL ACTIVITIES

A. FORCE SUMMARY

<u>Operation</u>	<u>Monthly Salaried</u>		<u>Weekly Salaried</u>		<u>Total</u>	
	<u>8-31-65</u>	<u>9-30-65</u>	<u>8-31-65</u>	<u>9-30-65</u>	<u>8-31-65</u>	<u>9-30-65</u>
General Manager's Group	10	10	2	2	12	12
Finance & Services	38	38	46	47	84	85
Employee Relations	11	11	6	6	17	17
Research & Engineering	58	56	30	29	88	85
Facilities Engineering	93	94	209	199	302	293
Production	5	5	3	3	8	8
Redox	63	61	240	237	303	298
Purex	74	74	292	289	366	363
Weapons Manufacturing	<u>54</u>	<u>54</u>	<u>234</u>	<u>233</u>	<u>288</u>	<u>287</u>
Total	<u>406</u>	<u>403</u>	<u>1062</u>	<u>1045</u>	<u>1468</u>	<u>1448</u>

B. Personnel Changes for September

J. W. McCurry, Transferred from IPD, effective 9-1-65, to assume the position of Manager, Business Information Systems.

C. C. Hinson - Manager, Maintenance, Weapons Manufacturing, took optional retirement effective 9-1-65.

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RL-SEP-755

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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. Tomlinson	US-AEC Germantown, Md.	R&D Programs. (9/1/65)
G. C. Oberg	Sandia Corp. Albuquerque, N.M.	Engineering Data Com- puterization. (9/8-10/65)
P. W. Smith J. J. Shefcik	E. I. du Pont Savannah River Plant Augusta, Ga.	Fission Product Recovery. (9/15/65)
P. W. Smith	Oak Ridge National Lab. Oak Ridge, Tenn.	Fission Product Recovery. (9/16-17/65)
W. C. Johnson O. F. Hill	E. I. du Pont Savannah River Plant Augusta, Ga.	Analytical Methods. (9/16-17/65)
J. J. Shefcik	Oak Ridge National Lab. Lyons, Kansas	Waste Disposal. (9/17/65)
J. W. Fillmore	Dow Chemical Co. Rocky Flats, Colo.	Incinerator Design. (9/20/65)
V. W. Smith R. W. Calhoun	Mound Laboratory Miamisburg, Ohio	IMOG Subcommittee. (9/20-21/65)
J. W. Fillmore M. E. Borgeson	Oak Ridge National Lab. Oak Ridge, Tenn.	Incinerator Design. (9/21/65)
A. E. Smith	Lawrence Radiation Lab. Livermore, Calif.	O3 Program. (9/27/65)
R. J. Sloat R. E. Olson S. G. Smolen	Oak Ridge National Lab. Oak Ridge, Tenn.	Thorium, U-233. (9/27/65)
	E. I. du Pont Savannah River Plant Augusta, Ga.	Plutonium, U-233. (9/28-29/65)
<u>To General Industry</u>		
J. W. Fillmore M. E. Borgeson	Nash Cadmus, Volker Co. Freeport, N.Y.	Incinerator Design. (9/24/65)
	Morse, Bolger Co. Corona, N.Y.	Incinerator Design. (9/24/65)

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RL-SEP-755 UCL

C. TRIPS (Continued)

<u>Visitors</u>	<u>To</u>	<u>Nature of Discussion</u>
<u>To Conventions and General Meetings</u>		
H. D. Haberman	Denver, Colo.	Society for Applied Spectroscopy. (8/31 - 9/3/65)
J. J. Shefcik P. W. Smith M. H. Campbell O. F. Hill W. C. Johnson	Atlantic City, N.J.	ACS Meeting. (9/13-16/65)
V. W. Smith J. W. Fillmore P. E. L. Nussbaum	Chicago, Ill.	Machine Tool Show. (9/25/65)
<u>To Other Government Agencies</u>		
J. W. Fillmore M. E. Borgeson	Edgewood Arsenal Edgewood, Md.	Incinerator Design. (9/22/65)
<u>To Colleges and Universities</u>		
J. W. Fillmore M. E. Borgeson	Harvard University Cambridge, Mass.	Incinerator Design. (9/23/65)

D. VISITORS

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From AEC and Other AEC Contractors</u>		
George Quinn	US-AEC Germantown, Md.	Purex tour. (9/8/65)
Neil Davis	LASL Los Alamos, N.M.	Quality Assurance. (9/21-23/65)
William Miller William Bickley	DMA Albuquerque, N.M.	Quality Assurance. (9/21-22/65)
W. M. McCluggage A. A. Schoen W. L. Lennemann	US-AEC Germantown, Md.	Nuclear Safety. (9/28/65)

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RL-SEP-755

D. VISITORS (Continued)

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From General Industry</u>		
J. Ruggles	Almac-Stroum Electronics Seattle, Wash.	Transistors and Circuits. (9/8/65)
J. Luke	Texas Instruments Dallas, Texas	Transistors and Circuits. (9/8/65)
R. J. Kremer	The Bendix Corporation Los Angeles, Calif.	Decontamination Procedures. (9/14/65)
Dr. T. Bulat W. Scharmack	The Bendix Corporation Davenport, Iowa	"
H. C. Annas	Air Control, Inc. Seattle, Wash.	"
F. Morris	Turco Products, Inc. Spokane, Wash.	Decontamination Chemicals. (9/16/65)
Dr. K. Newman	Turco Products, Inc. Los Angeles, Calif.	"
T. D'Muhala E. Holt	General Dynamics Croton, Conn.	Decontamination Procedures. (9/29/65)

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CHEMICAL PROCESSING DEPARTMENT

MONTHLY REPORT

SEPTEMBER, 1965

IV. SAFETY AND SECURITY

<u>Operation:</u>	<u>General</u>	<u>Purex</u>	<u>WMO</u>	<u>FEO</u>	<u>Redox</u>	<u>R&E</u>	<u>Finance</u>	<u>Prod.</u>	<u>Empl. Rel.</u>	<u>Total</u>	<u>YTD</u>
Dis. Injuries										0	0
Ser. Accidents										0	3
Med. Treat. Inj.		11	12	19	8		2			52	372
Rad. Occurrences		4	3		2					9	90
Contam. Wds.			1							1	17
New Deposition Cases										0	1
Fires										0	3
Security Violations				1						1	11

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RL-SEP-755

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

SEPTEMBER, 1965

V. REPORTS

A. PREPARED AND ISSUED

- RL-SEP-232 L38, Secret, "Button Purity Data - Letter No. 38", dated September 13, 1965, by R. J. Sloat.
- RL-SEP-232 L39, Secret, "Button Purity Data - Letter No. 39", dated September 27, 1965, by R. J. Sloat.
- RL-SEP-274, Secret, "Z Plant Feed Specifications - Plutonium Nitrate Solutions", dated September 10, 1965, by R. L. Walser.
- RL-SEP-324, Unclassified, "Critical Mass Control Specification, 234-5 Analytical Laboratory", dated September 2, 1965, by R. J. Sloat.
- RL-SEP-394 REV, Unclassified, "Critical Mass Control Specification - Uranium-233 Purification, 234-5 Building", dated September 1, 1965, by R. J. Sloat.
- RL-SEP-414, Unclassified, "Stirred-Bed Gas-Solids Reactor for Preparing Plutonium Trichloride", dated August, 1965, by T. S. Soine.
- RL-SEP-687, Unclassified, "Critical Mass Control Specification - Storage of Plutonium-Bearing Materials in Igloos T-103 and T-104", dated September 1, 1965, by R. J. Sloat.
- RL-SEP-697, Secret AWD, "Inspection Methods for 104-C Components", dated September 8, 1965, by L. L. McGregor.
- RL-SEP-698, Unclassified, "Trip Report: Factory Mutual Research Corporation, Mound Laboratory, and Argonne National Laboratory - August 17 to August 21, 1965", dated September 1, 1965, by R. E. Felt.
- RL-SEP-699, Unclassified, "Critical Mass Control Specification - Transportation of a Single Large Box by Motor Truck", dated September 3, 1965, by R. J. Sloat.
- RL-SEP-702, Secret, "Trip Report to Savannah River Plant, Tritium and Polonium Technology", dated August 11, 1965, by J. R. LaRiviere and D. D. Wodrich.

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RL-SEP-755

DEL

A. PREPARED AND ISSUED (Continued)

- RL-SEP-705, Secret AWD, "Weapons Process Engineering Technology Report - August 1965", compiled by Members of Weapons Process Engineering, R&E - CPD, dated August 31, 1965.
- RL-SEP-709, Secret AWD, "O3 Program Support Proposal", dated September 3, 1965, by A. E. Smith
- RL-SEP-712, Unclassified, "Summary of U-233 Studies in the Plutonium Chemistry Laboratory", dated September 8, 1965, by H. T. Fullam.
- RL-SEP-715, Secret AWD, "Template Data", dated September 8, 1965, by A. E. Smith.
- RL-SEP-716, Secret AWD, "A-Line Product Characteristics - August 1965", dated September 9, 1965, by A. E. Smith.
- RL-SEP-720, Secret AWD, "Evaluation of Fabrication Process Test 64-3; Isostatic Press Stabilization of Unalloyed Plutonium Weapon Components", dated September 10, 1965, by C. M. Walker.
- RL-SEP-720 1, Secret AWD, "Evaluation of FPT-64-3; Isostatic Press Stabilization of Unalloyed Plutonium Weapon Components", dated September 21, 1965, by C. M. Walker.
- RL-SEP-724, Secret AWD, "Analysis of Isostatic Pressing Results 600 Type Parts", dated September 15, 1965, by I. N. Taylor.
- RL-SEP-727, Unclassified, "Critical Mass Control Specification - Leached Ash, 236-Z Building", dated September 20, 1965, by R. J. Sloat.
- RL-SEP-730, Unclassified, "Button Storage Test", dated September 22, 1965, by R. L. Walser.
- RL-SEP-732, Secret AWD, "Plutonium Isotopic Determination", dated September 21, 1965, by A. E. Barber.
- RL-SEP-734, Secret, "Analyses of Neptunium Batch - Purex No. 34", dated September 13, 1965, by M. K. Harmon.
- RL-SEP-735, Unclassified, "Test Procedure - W-2 Column, 242-Z Building - Waste Treatment Facility", dated September 21, 1965, by L. E. Bruns.
- RL-SEP-745, Secret AWD, "104-C Methods Approval", dated September 28, 1965, by A. E. Smith.

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B. PREPARED FOR SIGNATURE AND ISSUANCE

RL-GEN-27, Secret, "Production - August, 1965", dated September 20, 1965,
by W. E. Johnson.

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

SEPTEMBER, 1965

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

H. T. Fullam

Method for Preparing Mixed
Oxide Flat Bed Gas Solids
Contactor.

R. S. Rosenfels

Ceramic Motor-driven Stirrer
for Use in Molten Salt and
Molten Plutonium Metal.

J. H. Warner
General Manager
Chemical Processing Department

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END

**DATE
FILMED**

2 / 12 / 93