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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT
FOR

RL-SEP--405-Del.

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MARCH, 1965

Compiled By
OPERATION MANAGERS

April 22, 1965

HANFORD ATOMIC PRODUCTS OPERATION
RICHLAND, WASHINGTON

Work performed under Contract No. AT(45-1)-1350 between
the Atomic Energy Commission and General Electric Company.

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

MARCH, 1965

I. SUMMARY

March production, as a per cent of the HAPO Production Forecast (RL-GEN-9), is summarized below:

	<u>March</u>	<u>Fiscal Year</u> <u>To Date</u>
Separated plutonium nitrate	107	104
Separated uranium nitrate	115	105
Uranium oxide	102	101
Plutonium metal buttons	119	102
Fabricated parts	100	100

March production equaled or exceeded forecasted quantities for all products.

After a three-day shut-down for replacement of a section of the steam condensate header, Purex operation was interrupted briefly on two other occasions to allow replacement of failed pumps. Otherwise, performance was uneventful at a rate of 30 tons per day; both products met specifications except for a short period following one start-up.

The HAPO I-B-1 cask, loaded last month with 340,000 curies of strontium-90, was shipped to the Oak Ridge National Laboratory on March 15.

A neptunium purification run was completed during March and yielded 1165 grams of neptunium product.

For the first two weeks of March, Redox activities were confined to the completion of those programs which were started in February. These included a neptunium removal campaign, acid flushes, and the installation and modification of processing equipment. Processing of E-metal was resumed on March 16. Except for three brief outages, totaling about one day, performance was satisfactory for the balance of the month.

The Redox neptunium removal campaign was only partially successful. When process difficulties interfered with the run, approximately two-thirds of the inventory was left in the system, to be retrieved during the next neptunium campaign.

A new column (1-N) and process flowsheet modifications were tested in Redox on a prototype basis to improve uranium and plutonium decontamination while re-

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taining good recovery of neptunium. Uranium and plutonium decontamination has improved by a factor of three; product recoveries have been excellent.

The In-Tank Waste Solidification unit has operated continuously since March 19, following replacement of the failed circulator. By month-end the evaporation rate had increased to 6,000 gallons per day and the tank contents had reached a temperature of 150° F.

The first attempt to purify americium in quantity by chromatographic ion exchange was only partially successful. The feed contained gross amounts of aluminum, which remained closely associated with the americium on the ion exchange resin. Of the 75 grams of americium in the starting solution, only 25 grams were purified. Flowsheet modifications are under study.

Representatives of France, Germany, and the Division of International Affairs witnessed the sampling and packaging of 100 kilograms of unclassified plutonium metal for Euratom.

General Manager
Chemical Processing Department

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

MARCH 1965

II. ACHIEVEMENTS

A. PRODUCTION OPERATION

1. Production Statistics

a. <u>Percent of Forecast(1) Achieved</u>	<u>March</u>	<u>Fiscal Year to Date</u>
Separated plutonium nitrate	107	104
Separated uranium nitrate	115	105
Uranium oxide	102	101
Plutonium metal buttons	119	102
Fabricated parts	100	100

b. <u>Purex</u>	<u>March</u>	<u>February</u>
Uranium nitrate produced (tons)	807	391
Average production rate during operation (T/D)	30	30
Total waste loss (%)		
Plutonium	0.30	0.43
Uranium	0.29	0.38
On-line efficiency (%)	85	50

c. <u>Redox</u>		
Uranium nitrate produced (tons)	118	158
Average production rate during operation (T/D)	9	10
Total waste loss (%)		
Plutonium	0.32	0.26
Uranium	0.18	0.14
On-line efficiency (%)	92	92

d. <u>Uranium Reduction (tons)</u>		
Normal UO ₃ loaded	630	104
Enriched UO ₃ loaded	253	192
Normal UO ₃ approved for storage	602	140
Enriched UO ₃ approved for shipment	253	202
Normal UO ₃ shipped	0	0
Enriched UO ₃ shipped	253	253
Normal UNH backlog	504	327
Enriched UNH backlog	163	298

(1) RL-GEN-9, HAP0 PRODUCTION FORECAST

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f. Power

	<u>200-East</u>	<u>200-West</u>
Raw water pumped (gpm)	8 936	5 002
Filtered water pumped (gpm)	1 129	1 193
Maximum steam generated (lbs./hr.)	266 000	162 000
Average steam generated (lbs./hr.)	216 000	109 877
Total steam generated (M lbs.)	160 719	81 749
Coal consumed (tons)	7 971	4 099

March production equaled or exceeded forecasted quantities for all products.

Acting Manager, Production

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2. FISSION PRODUCT DATA (Kilocuries)

Cs-137

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CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (Continued)

B. PUREX OPERATION

1. Operating Continuity

The Purex Plant was shut down March 2, 3, and 4, 1965, to replace a section of the steam condensate header. Processing resumed on March 5, 1965 and was interrupted twice during the month to replace canyon process pumps. The H1 (HA column feed) pump failed on March 13, 1965, and was replaced along with the HAF (HA column feed) control valve jumper during a ten-hour outage. The F10 (Backcycle waste concentrator feed) pump failed on March 24, 1965, and was replaced during a nine-hour shutdown. Rates were at a capacity factor of 3.6 except during startup periods.

One neptunium purification run of combined Purex-Redox material was completed, yielding 1165 grams.

Purex Head End fission product recovery resumed on March 11, 1965 and twelve runs were completed by the end of the month. Product recoveries on the first seven runs totaled 250 and 950 kilocuries of strontium-90 and promethium-147, respectively. Of a total of 19,500 gallons of 1WW (Purex high level waste) generated, 15,000 gallons were processed for fission product recovery since March 11, 1965. This represents a significant improvement in efficiency over past processing and is attributed mainly to the additional 1WW (Purex high level waste) surge capacity supplied by Tank F15.

The crude fission product inventory in the flooded 003 CR Tank was transferred to B Plant. The 18,000 gallons (plus flushes) containing about 650 kilocuries of strontium-90 and approximately 1800 kilocuries of promethium-147 were concentrated to 4,000 gallons. Laboratory studies to define the necessary flowsheet modifications for oxalate processing of this material are underway. Initial analyses indicate the strontium is not degraded. The flooded 002 CR Tank contents containing 180 kilocuries of aged promethium-147 were sampled and discarded to Tank 103-A.

Aged promethium processing continued at the Strontium Semiworks. Manganese removal was completed by the sulfate precipitation of the rare earths and decantation to waste of the manganese-bearing supernate. The separation of cerium from the other rare earths by the silver catalyzed persulfate oxidation method resulted in 90 percent removal of the cerium. The separation of the rare earths

from the resulting sulfate solution is being performed in the HA-HC solvent extraction columns. Repeated recycles through the columns have been necessary to reach acceptable product losses to the waste. Causes of the poor process performance have not been defined. The marginal flowsheet performance has reduced the initial 400 kilocuries of promethium-147 to less than 200 kilocuries.

Waste management activities included installation of the replacement circulator for the In-Tank Waste Solidification Unit in Tank 101-BY. Continuous operation of the unit has been achieved since startup on March 19, 1965. The strain gage data indicate this circulator exhibits no structural deficiencies or abnormal movements. The evaporation rate from Tank 101-BY has averaged about 3500 gallons per day since startup and is currently at 6,000 gallons per day at a solution temperature of 150°F. Coating waste transfers to 200 West Area storage tanks totaled 200,000 gallons in March, 1965. Tank 103-AX reached boiling at the end of the month.

A liquid level rise in Tank 103-C, the cesium feed tank, was apparently caused by a failed line in the encasement between the 152-CR diversion box and Tank 102-C which permitted coating waste from the Purex Plant to leak into the encasement and drain to Tanks 101-C, 102-C, and 103-C via the tank pump pits. Coating waste has been routed through a spare line to Tank 102-C and no further leaks have been detected. The coating waste solution accumulated in Tank 103-C did not significantly affect cesium loading capability as a cask was loaded normally following the incident.

2. Processing Operation

Uranium met specifications except for one batch during a startup period. Plutonium product met specifications.

The HAPO-I-B-1 cask, loaded last month at the Strontium Semiworks with 340,000 curies of strontium-90, was shipped to the Oak Ridge Laboratory on March 15, 1965. The second cesium cask received in February, 1965 was loaded with approximately 48,000 curies of cesium-137. A five gallon Battelle Northwest sample cask was loaded with cesium feed solution from Tank 103-C and shipped to the 300 Area for investigative studies of contained fission products.

3. Equipment Experience

A section of the steam condensate header near the southeast corner of the Purex Plant was replaced to eliminate steam leaks. Additional leaks were also discovered on the same header near the southwest corner of the Purex Plant. Temporary repairs of that section of the header have been made.

A major overhaul of a Joy process air compressor at the Purex Plant was completed to improve the performance and dependability of the unit. The overhaul consisted of replacing cylinder sleeves, pistons, rings, bearings, valves, seals, and other parts as required. This work was a Preventive Maintenance Program item.

A comprehensive electrical inspection and repairs were made to the Purex east canyon crane to improve crane performance and dependability. The work consisted of adjusting and repairing as required all relays, motor starters, D.C. rotating equipment, limit switches, electric motors, control circuits, selector switches, operators, terminal blocks and all other connections. This work was a Preventive Maintenance Program item.

The Tank F8 (Waste rework tank) agitator in the Purex canyon failed because of mechanical trouble; exact cause unknown. Replacement was made with a used agitator with standard speed and shaft length from Tank E6 (HA column feed storage tank). The replacement for Tank E6 was a used, slow speed, standard length agitator from Tank E3 (fission product precipitation tank). The replacement for Tank E3 was a new slow speed, long shaft agitator from Spare Equipment. These agitator movements were made to improve process performance.

The load cable on the ten-ton hoist of the Purex West Canyon crane was replaced. The old cable had become damaged and was no longer dependable.

Sixteen Purex canyon trench blocks were replaced and three boxes of failed Purex process jumpers were buried.

A significant increase in radiation level in the Number 3 caisson lateral under Tank 105-A was found during routine checks on March 8, 1965. Radiation measurements taken with a shielded probe showed a "hot" spot (10-20 R per hour over a distance of two feet) in a section of the lateral under the edge of Tank 105-A. The radiation level in the lateral has not changed since the increase was first noted. Normal radiation levels in adjacent laterals and test wells indicate the activity has not spread appreciably. A test hole was drilled near the contaminated lateral to a depth of about nine feet above the tank bottom. Soil samples taken from the test hole showed no radioactivity. Another "hot" spot was detected in the same lateral beneath the edge of Tank 105-A in November, 1963. The intensity of the activity in that location has since decreased to one third its initial value (much less than 0.1 R per hour).

Water lance probing conducted on March 14, 1965 through a 4-inch riser of Tank 105-A indicated a sludge layer at about ten feet and metal at eight feet above the normal tank bottom. This information and the lower-than-normal static pressure and differential pressure measurements on two of the four circulators located adjacent to the 4-inch riser indicate the tank bottom may be distorted upward as much as eight feet. The installation of a new pump pit for Tank 105-A is in progress in order to provide capability for lowering the liquid level in the tank.

4. Radiation Experience

Iodine 131 emission from the Purex Plant was normal during the month except for the week ending March 21, 1965 when the emission rate increased to an average of one curie per day. The higher emission rate is believed to have been due to processing minimum cooled metal.

5. Analytical Experience

Analytical support was provided for the sulfate removal processing of rare earth material at the Strontium Semiworks.

A new procedure has been developed for separating microgram values of thorium from gross quantities of plutonium, neptunium, and uranyl nitrates. Uranium and neptunium are separated by preferential absorption on a strong anion exchanger from a hydrochloric acid solution of the sample. Decontamination from plutonium-III, and trace values of neptunium and uranium is achieved by extracting thorium with trioctyl-phosphine oxide (TOPO). Results to date

have shown quantitative recoveries on various Purex process solutions.

Considerable analytical support was spent in characterizing the waste solution in the F-8 rework vessel. The Remote Analytical Cave was used to advantage because of the high radiation levels encountered in these waste samples.

Calibration of the wide beta counting instrument for phosphorus-32 was accomplished. These analyses are now being counted automatically, using the automatic sample changing accessory of this instrument. Use of the wide beta counter has helped to relieve the beta counting load.

The program of using a coulometric measurement to determine an independent shipper report value to the plant was carried on throughout the month. Data generated to date are being evaluated to help determine if this analytical approach will produce an acceptable basis for Purex input accountability. A more simple, rapid, alternate method of measuring uranium in dissolver solution spectrophotometrically is being pursued.

Manager-Purex

WM Harty:MLM:gt

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CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (Continued)

C. REDOX OPERATION

1. Operating Continuity

Processing activity in the Redox plant during the first two weeks of March was confined to completion of the special processing programs started during February, namely: 1) a neptunium recovery campaign; 2) a high concentration nitric acid flush of the processing equipment to satisfy the periodic inventory and nuclear criticality control requirements; 3) dissolution and processing of the siliceous solids accumulated as sludge in the metal solution receiving vessels. Virgin E-metal processing was resumed on March 16 and except for three short interruptions, totaling one day, was continuous for the balance of the month. The scheduled production for the month was exceeded.

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 neptunium recovery campaign completed this month was only partially successful with only about a third of the in-plant inventory being removed. The remaining two-thirds was left in the system when process difficulties interfered with the run. Most of the problems were involved with inadequate stripping in the 1B partition column and the difficulty in making proper acid adjustments with resultant high waste losses. It is planned to perform the next campaign by by-passing this column entirely.

Dissolution and processing of the accumulated solids in the H-8 and H-9 metal solution receiving tanks was accomplished without incident. The dissolved solids contained approximately 600 pounds of uranium and 384 grams of plutonium, which was substantially less than expected based on earlier analyses and estimates of sludge volumes.

E-metal processing was resumed on 3-16-65 following the extended outage for special processing activity and new equipment installations. Plant performance through month-end was satisfactory, there being only three short process interruptions, totaling slightly in

excess of one operating day. On-line and mechanical efficiencies of 92 and 99 percent respectively, were achieved for this period.

While an instantaneous capacity of 110 percent was sustained during the second week of E-metal processing, there were some problems associated with the period immediately following startup that did restrict rates. An acid imbalance in the backcycle salt system caused 1S column waste losses which necessitated diversion of processing to total rework. Lack of adequate decontamination through the uranium and plutonium cycles also was experienced. A Zr-Nb break-through with the uranium product required silica gel treatment of the UNH to meet shipping specifications. Some plutonium product which failed to be separated from ruthenium, and contains some uranium contamination, is being held pending further treatment as recycle material.

b. Uranium Oxide Processing

Enriched uranium oxide production was sporadic during the first half of the month due to a shortage of shipping hoppers. However, 30 hoppers were received at mid-month which permitted two-calciner operation for the balance of the month. Operating continuity during this period was excellent and the expected enriched oxide production was exceeded.

Four calciners were operated on depleted uranium oxide production this month. Although intermittently plagued with feed line restrictions and the loss of one calciner for approximately one week due to a heating element failure, production rates were satisfactory and the expected production was met.

3. Maintenance Experience

a. Redox Plant

The major maintenance activity this month was the installation of the new prototype 1N column in the Redox silo. In form it is a "jack-leg" unit installed as a jumper adjacent to the 1O column, 25 feet long, six inches in diameter, and packed with three-quarter inch 304 stainless steel Pall rings. The column's function is to strip the bulk of the accumulated neptunium directly to the D-14 backcycle concentrator in lieu of an intermediate strip to the 2EU concentrator via the 2E column. Operation of the new unit to date has indicated functional success during the short period of operation. Further experience with the new column will be required before a complete evaluation of performance in relation to improved acid controls, reduction in chemical cost, and prospective advantage to precycle decontamination can be made.

A newly designed external steam-chest type reboiler was installed in the D-14 backcycle waste concentrator. The new unit is expected to provide additional boilup capacity for the D-14 concentrator, thus relieving the restriction now imposed on this vessel at higher backcycle salt processing rates.

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DECLASSIFIEDb. Uranium Oxide Plant

Considerable trouble was experienced this month with the D-6 enriched uranium concentrator leaking UNH into the steam chest. Regasketing of the lower head did not solve the problem and the concentrator was replaced. The change-out was accomplished without experiencing any over-all downtime.

The center bottom heating element in the L-calciner failed on March 15. Inspection revealed that the failure was caused by sand from the sand seal sifting through cracks in the firebrick wall and coming in contact with the heating element. Repairs were completed and the unit returned to service on March 22.

4. Waste Handling and Decontamination

Equipment valued at approximately \$170,000 was received from customers for decontamination, repair, inspection or burial during the month. Equipment valued at approximately \$93,000 was returned to customers, representing a savings of approximately \$26,000 based on the cost of new equipment.

Tank farm tank leakage continues to be an area of major concern. The 115-SX tank, which contained approximately four feet of dissolved sodium nitrate salt and was being held as a reserve waste tank, suddenly developed a large leak and 16 inches of solution was lost to ground. The balance of the material in the tank was pumped to the 105-SX tank and as soon as the steam and vapor in the tank clear up, inspection and photographing of the tank interior will be done in an effort to obtain additional information relative to the leak.

Radiation readings in the horizontal laterals beneath the suspected leaking tanks in the 241-SX Tank Farm did not change significantly during the month, nor have any changes in liquid levels occurred. Continued close surveillance is being maintained and plans initiated to provide reserve capacity in the event that an active leak should develop in any of the tanks.

5. Analytical Experience

The Redox Analytical Laboratory provided: 1) priority krypton-85, 87, and 88 analyses on cooling water samples from the KE and C Reactors, Irradiation Processing Department, to determine evidence of slug ruptures; 2) special strontium-90, americium-241, plutonium and neptunium analyses on a series of waste tank samples submitted by Battelle-Northwest Laboratory, in support of flowsheets designed to recover these products from Purex plant's wastes; 3) lead, cerium, and neodymium determinations for the Separations Chemistry Laboratory to evaluate a flowsheet for the separation of lead from rare earths; 4) control analyses on an americium-241 purification run.

S. D. Smolin
Manager - Redox

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (Continued)

D. WEAPONS MANUFACTURING OPERATION

1. Operating Continuity

The fabrication of Model 1807 weapon components and Model 88-C weapon components was without significant interruption during the month. The production of unfabricated weapons-grade plutonium was normal, with some interruption resulting from minor mechanical failures. Recovery operations were normal, but failure of both dissolvers slowed the processing of slag and crucible fragments. The incinerator, the waste-treatment facilities and the americium recovery equipment all performed without significant interruption.

2. Processing Operations

a. Plutonium Fabrication

Information on plutonium fabrication activities is presented in Document RL-SEP-418 (Atomic Weapon Data).

b. Plutonium Reduction

The production of unfabricated weapons-grade plutonium was satisfactory and the quality was good.

A total of 100.5 kilograms of unclassified plutonium metal was prepared, sampled and packaged for Euratom. Representatives of France, Germany and the Division of International Affairs witnessed the operation.

Representative samples of the plutonium oxide packaged for Euratom in January were forwarded to Karlsruhe during the month.

The "A" Button Line area has been cleaned and renovation work on Hood 9-A equipment was started.

c. Plutonium Reclamation

One hundred eighty-five (185) kilograms of normal plutonium were delivered to the button line from the recovery facilities during the month.

One hundred thirty-five boxes of waste and twenty-one packages of leachables were processed through the incinerator facility during the month.

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Both of the slag and crucible dissolvers were operated at test rates during the month. A total of 240 cans of slag and crucible fragments were processed. During the latter half of the month, leaks developed in both dissolvers. The Mark I (06) was repaired and returned to service by month-end.

Two hundred seventy-two (272) grams of plutonium were returned to the main process stream from 71,000 liters of aqueous waste, which were processed through the waste-treatment facility. Also, 12.3 grams of americium were recovered and stored for future processing. The total in storage is now 94.8 grams (after adjustment of prior inventory).

3. Mechanical Performance

The performance of the fabrication and final inspection equipment was satisfactory, except for the faulty controls of the lathes in HA39 and the failure of four tanks of the automatic film-development equipment in the X-ray facility.

The button-line equipment operation was interrupted by numerous minor mechanical problems related to the cloth on the vacuum-drum filter; the control of feed flow; and the maintenance of adequate vacuum on the fluorinator.

Recovery equipment performed well, except in the cases of the slag and crucible dissolvers where severe leaks developed, and the Chem-pumps where five replacements and four overhauls were required.

4. Radiation Experience

Radiation and contamination control statistics indicated satisfactory control.

There were no cases of potential plutonium deposition during the month.

5. Analytical Experience

Number of samples received	2,961
Number of determinations	17,944

A new scanning technique for the mass spectrographic analysis of plutonium was initiated during the month. The new method has the advantage of better precision between scans, and at the same time reduces scanning time by approximately 20%.

Several samples of various caustic solutions were analyzed for Purex in support of the strontium-recovery program.

WJ Gartin
Manager
Weapons Manufacturing

WJ Gartin:ap

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

MARCH, 1965

II. ACHIEVEMENTS (Continued)

E. FINANCIAL OPERATION

1. Production Cost Accounting

The operating budget for fiscal years 1966-67 continued in March to be our major effort. Preliminary budget accumulation and distribution figures were reviewed with all Section Managers during the month. Manpower requirements by craft or discipline for the budget period were provided to Section Managers to assist in manpower planning in an effort to integrate the prospective Redox shutdown with startup of Phase III waste management. Numerous budget changes and delays were necessitated by (a) new planning to startup the 242 Waste Evaporator, (b) reduction of fission product funding from \$2.4 million to \$1.7 million, and (c) the AEC specified distribution on a "use" basis of a number of charges previously charged to overhead.

Special Requests handled during the month were:

Pu Metal and oxide to Battelle Memorial Institute, Columbus, Ohio
Pu Metal to Battelle Northwest
Pu Oxide to Battelle Northwest
Pu Metal to NUMEC for SEFOR
U-233 Oxide to University of California - LRL

2. General Accounting

As of February 28, 1965, twenty active projects had incurred costs of \$4,014,109 against authorized funds of \$6,041,174. Outstanding commitments totaled \$402,513.

Construction completion and cost closing statements were issued during March on the following projects:

<u>Project No.</u>	<u>Project Title</u>	<u>Total Cost</u>
CAC-880	Plutonium Reclamation Facility - Z Plant	\$1 685 173
CAC-912	Waste Treatment Facility - Z Plant	714 896
CAC-964	Equipment Disposal - Purex	24 264
CAC-965	In-Tank Waste Solidification - 200 East Area	180 338
CAC-110	Additional Plutonium Casting Lines - RMA Line 234-5 Building	1 710
CAC-117	Steam Lines Modification - 200 Areas	4 705
CGC-122	Exhaust Ventilation Facility - 233-S Bldg.	71 104
CGC-134	UO ₃ Storage Facilities	35 838
CAC-140	Purex Ventilation Filter Replacement	6 000

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There were twelve (12) Appropriation Requests approved during the month of March, authorizing expenditures of \$58,790. The approved AR's are detailed as follows:

<u>AR No.</u>	<u>Description</u>	<u>Amount</u>
56040	Welding Positioner - 227-W	\$ 1 800
56041	Replacement 9-A Primary Filter	7 000
56042	Precision Surface Finish Measuring Equipment	8 500
56043	Gas Mixing Controllers	4 000
56044	Ultra Low Temperature Chest	2 000
56045	Paging Communications System - Reclamation	2 800
56046	Fluorimeter - 234-5 Building	2 700
56047	Sample Storage Hood - 234-5 Building	17 600
56049	Recording Flowmeters - A Farm	5 200
56050	Semi-Works-pH System Replacement	4 000
56051	Direct Reading Balances - Purex Lab.	2 190
56052	Foxboro Recorders	1 000
	Total	<u>\$58 790</u>

In addition, there were twelve (12) AR's in various stages of approval at month end. Total estimated cost for these AR's is \$126,945.

R. G. Connell
Manager - Finance

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CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (continued)

F. FACILITIES ENGINEERING OPERATION

1. Purex

Purex 4.0 Capacity Factor Expansion

The engineering study for the Purex 4.0 C.F. expansion was completed, and the initial engineering study document was drafted. Work on the design criteria document is being started.

Enriched 2 percent Uranium Processing

The nuclear safety technology is available for completion of the study. According to current information, the "E" Cell centrifuges must be replaced with units having a lower capacity for solids hold-up in order to assure criticality control. The required instrument modifications and additions have been defined.

Purex "N" Cell Modifications

The new Purex push-pull resin-puller has operated very successfully during a four-week shop test. This resin puller features 2- $\frac{1}{2}$ " diameter solid steel balls operating on a teflon plate with a 1.7" hole. A smaller ball and hole are contemplated for testing, but this equipment will be evaluated very carefully because of need for rapid removal of resin during a pressure build-up.

Drawings for the new tantalum-lined concentrator and cooler have been commented on and returned to the vendor (Fansteel). Delivery by the vendor is expected ten to sixteen weeks after design approval. Final design of the titanium receiver tank was completed.

Cover Block Removal

A shielded cab 5' x 6' x 8' has been designed to be set on the cover blocks by the crane. From within this cab, operators will core bore holes for installing new lifting bails to facilitate removal of the blocks. A lifting yoke has been designed to utilize the new lifting bails to remove the cover blocks. Both the yoke and the bails are being made on-site by the service contractor.

IBXP Neutron Monitor

The IBXP Neutron Monitor in the Purex Canyon failed after about two years of satisfactory service. This period is the expected life of the boron-tri-fluoride tube (BF_3) in the probe. The whole probe package was replaced, and the monitor system is now operating properly.

Purex Multi-purpose Dissolver

All component parts, including piping prefabrication and the coils, have been moved to the CPD Shops. Assembly was started and is progressing toward completion by May 15.

CAC-172-Plutonium Concentration and Storage Facilities - "L"
Cell - Purex

A project proposal requesting \$230,000 for replacement of the "L" plutonium concentrator package with an improved unit was transmitted to RLOO on March 3.

2. Redox

Redox D-14 External Cooler

The process design of the new external cooler and pump installation has been approved and issued.

108-SX High-level Probe

This GM probe which was modified to operate at the high levels (100 R/hr) found under the SX Farm Tanks has operated satisfactorily and is still in routine use.

Inspection of 115-SX Tank

The highly radioactive interior of 115-SX Tank is to be inspected by means of closed circuit television. The equipment is being assembled for what has now become a routine operation.

Electrical Connector Cleaner

Work was completed on the in-cell assembly for cleaning electrical jumper connectors by remote methods.

3. Weapons

Uranium Processing Facilities

Comment issues of process flow diagrams and engineering flow

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diagrams for the uranium button line and recovery facilities have been completed. Study (concept) drawings have been completed for all equipment except a load-out hood and concentrator. A rough draft of the design criteria has been completed.

Blending Facility Budget Study

The Engineer Study (Document RL-SEP-368) has been completed. The proposed work is for installation of plutonium nitrate solution receiving, blending, concentration, and dispensation facilities in Room 221 of the 234-5 Building.

"C" Button Line

Design criteria for replacement of glove boxes HC-7 and HC9B are being prepared. The cost estimate for this work was revised to \$750,000.

236-Z Building Modifications

Engineering was completed for improved controls to the steam PRV solenoid valve for Tank 43, and for the valves to Dissolvers 04 and 06. A mock-up of the 08 Dissolver was installed and tested in the Shops.

X-ray Film Developer

Corrosion on the X-ray developer tanks in final inspection was sufficient to require replacement of the tanks. A spray-wash system was devised to prevent accumulation of corrosive deposits and a work order was issued for installation of the system.

CGC-171-Analytical Laboratory Ventilation Modifications - 234-5 Building

A project proposal requesting \$75,000 for improving 234-5 Building Analytical Laboratory ventilation was authorized by Directive No. EQT-021, dated March 25.

4. General

Shippingport Fuel Handling Facility

Cell No. 44, 221-T Building, is being equipped for disassembly of the FWR blanket fuel assemblies. Design was completed on the storage rack, disassembly stand, and various handling tools. These items are scheduled to be ready for the first fuel shipment in April. A portable pipe saw is being modified for underwater sawing of the fuel assemblies. Delivery is expected in late May, after which final design of the saw table can be completed.

Annular Dissolver Charging Machine

Since the narrower annulus will not allow the normal free fall dumping method of charging annular dissolver, other concepts are being investigated. This work is being coordinated closely with NRD because the shipping canisters and handling methods impose special requirements for long-range programs of fuel enrichment. Various one-at-a-time dumping concepts are being tested in the CPD Shops, and a controlled-orientation chute has been devised to operate satisfactorily with the 6-3/4" annulus concept.

Waste Management

The manipulator and handling mechanism for the waste packaging mock-up has been modified and shipped, thus essentially completing shipment of major components. Assembly and testing of the mock-up was continued after addition of the remote welder assembly. Final adjustment of the equipment is being done by the vendor.

Phase III

The Atomic Energy Commission decided that the D₂EHPA flowsheet only should be adopted for Phase III Waste Management and requested deletion of all special facilities provided for the CSREX process and for the recovery of cesium from current waste. Accordingly, Revision 1 to the Phase III criteria has been prepared to define in a functional manner the revised "B" Plant cell allocation, the elimination of former Cell 31 and 32 phosphotungstate precipitation facilities, and the transfer of Cell 33, 34, and 35 functions to Cells 31 through 33 inclusive.

Maintenance Work Sample Program

The industrial engineering program of maintenance work sampling was modified on March 16 to a departmental basis. The modified program will sample all 308 employees continuously rather than in batches. Actually frequency of observation is no different than before, since approximately sixty observations per employee per year will be taken. The advantage of this method is that technician sample time will be nearly cut in half. Results will be more readily available; random error effects will be lessened; time between detection of performance levels and correction will be decreased; and costs to subscribers should be reduced by approximately 50 percent.

Continuity of service

The services of electricity, water, steam, craftsmen, and equipment were provided without interruption to assure continuity of production operations.

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2902-Z High Tank

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The tank was drained and inspected by engineering and power representatives. Minor repairs were made to the float and level target. Otherwise the condition of the tank allows postponement of repairs for several years.

Project Cost Data

Project Cost Information as of April 4, 1965:

Total Authorized Funds - 11 active projects	\$ 3 304 000
Total cost-to-date	1 481 000
Commitments and Open Work Releases	966 000
Unencumbered Balance	857 000
Costs Charged to above projects 2/28/65 to 4/4/65	181 000

Projects Closed-Out
Final Cost
(General Electric portion)

CAC - 880	\$ 1 685 173
CGC - 912	714 896
CAC - 964	24 264
CGC - 965	180 338
CAC - 110 (Abandoned)	1 710
CAC - 117	4 705
CGC - 122	71 104
CGC - 134	35 838
CAC - 140	6 000

 Manager, Facilities Engineering

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II. ACHIEVEMENTS (Continued)

G. RESEARCH AND ENGINEERING OPERATION

1. Separations Process Engineering

Purex

a. Thorium Processing

Studies of the effects of the recent thorium campaign on subsequent uranium processing operations are continuing.

- (1) The concentrations of fluoride in the streams of the acid recovery system are being monitored. Fluoride concentrations of the order of 0.001M, or less, are indicated. At these concentrations, no significant changes in equipment corrosion rates are expected.
- (2) About one pound of thorium accumulated in the Neptunium Recovery System, but no indication of excessive thorium in any of the plant products has been noted.
- (3) A trend for poor solvent quality during thorium processing was reported last month. Experiments performed by the Separations Chemistry Laboratory have indicated no deleterious effect of the thorium flowsheets on Purex solvent quality.

b. Neptunium Purification

During the March neptunium recovery campaign, the thorium concentration of the neptunium feed to the Neptunium Anion Exchange System was measured at about 0.3 gram thorium per gram of neptunium. Minor adjustments to the anion purification flowsheet resulted in a substantial thorium decontamination in that system and produced a product that met the shipping specification of 0.01 gram thorium per gram of neptunium. The decontamination performance of the Neptunium Anion Exchange Cycle is summarized below:

Decontamination Performance					
<u>Neptunium Anion Exchange</u>					
	<u>Pu</u>	<u>U</u>	<u>Zr-Nb</u>	<u>Ru</u>	<u>Th</u>
Arithmetic DF	<u>3</u>	<u>30,000</u>	<u>250</u>	<u>300</u>	<u>200</u>

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c. Water Quality

The permanganate demand values of raw water gradually increased from about 0.8 to 1.6 milliequivalents/liter during the first three weeks of March and then rose sharply to about 3.5 meq./liter over a three-day period. The sudden increase coincided with a rapid reduction in the water levels of upstream reservoirs. In order to improve water quality with respect to the indicated oxidizable organics, the filter plant feed water was made 0.6 ppm KMnO_4 , at month's end. This KMnO_4 requirement is comparable to March 1964 needs.

d. Solvent Quality

On the basis of plutonium retention values, the solvent quality of both solvent systems improved during March. The plutonium retention values of approximately 3×10^8 alpha counts per minute per gallon for the first cycle system and 6×10^7 for the second cycle system are still about three-fold and seven-fold higher than normal, respectively.

e. Uranium Processing

Product quality and process performance during the processing of normal irradiated uranium is satisfactory, but the performance of the IC and 2E Columns is marginal at the high processing rate of $\text{CF} = 3.6$. Uranium waste losses from the IC and 2E Columns averaged respectively about fifteen and five-fold above the analytical detection limit (of 0.002 per cent) during the month. Normal losses from these columns are near or below the detection limit. The reasons for the restricted capacity (the columns should be good for $\text{CF} = 4.0$) and above-normal waste losses of these columns have not been identified, but are believed to be related to poor solvent quality, poor water quality, and/or a change in the wetting characteristics of the column plates.

f. Waste Rework

A batch of waste rework solution, comprising sump and chemical flush solutions accumulated in the plant over the past four months, has been concentrated and hydrolyzed in the Waste Rework Vessel (TK-F8). Recent investigation showed TK-F8 to contain a layer of sludge about six inches thick, about 4000 gallons of supernate, and a thick, frothy layer of sludge floating on the supernate. About six hundred gallons of three molar nitric acid were added to the tank and the solution was boiled for a short time before sampling. Analysis of the contents of TK-F8 indicates that the supernate was probably basic prior to addition of the nitric acid and that essentially all of the uranium and plutonium is associated with the sludge. Dissolution studies of sludge samples showed the plutonium to go into solution much more slowly and to require a considerably stronger dissolvent than the uranium, indicating the probable presence of plutonium polymer (see item 4a). Special procedures have been prepared to effect the dissolution and recovery of the product values. The amounts of product involved are of the order of a kilogram of plutonium and two tons of uranium.

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DECLASSIFIEDRedoxa. Neptunium Recovery

Neptunium extraction and recovery in the Redox process is dependent on the use of an acid flowsheet which permits less decontamination from fission products than does the acid deficient flowsheet. To accomplish both decontamination of uranium-plutonium and neptunium recovery, uranium and plutonium are extracted from an acid-deficient system in the HA Column, and the neptunium is subsequently recovered in the HS Column from the concentrated and acidified HAW waste. By the original recovery system, the HAP (uranium-plutonium) and HSP (neptunium) organic product streams were combined for product stripping in the HC Column. The neptunium was subsequently recycled to the HA Column via the acid-deficient IA Column aqueous raffinate (IAW). Although this flowsheet provided efficient neptunium accumulation, fission products in the HS Column feed (acidified and concentrated HAW) were re-introduced to the plutonium-uranium product streams and the decontamination performance of the precycle system was adversely affected.

To avoid the loss of decontamination efficiency and still provide good neptunium recovery, a prototype column (I-N) was designed that could provide capability for separately stripping the neptunium product from the HSP stream. This prototype column was installed during March and has been in use during the March processing period. The extracted neptunium in the HSP is stripped in the I-N Column and the aqueous neptunium product stream is recycled via the backcycle waste concentrator to the HA Column. Although flowsheet adjustments are still being made to bring stream compositions to optimum values, neptunium stripping has been excellent and the precycle decontamination factor has been increased by a factor of three.

b. Solids Dissolution from H-8 and H-9 Tanks

Dissolution of solids containing uranium and plutonium in the H-8 and H-9 tanks was previously reported to have resulted in the recovery of 332 pounds of uranium and 408 grams of plutonium (RL-SEP-332 G). Based on revised analytical results, these values have been corrected to 600 pounds of uranium and 384 grams of plutonium.

2. Fission Products Process Engineeringa. In-Tank Solidification

The In-Tank Solidification Unit was started up on March 19 following replacement of the failed circulator. The new air-lift circulator differed from the failed unit in two important respects. The annular circulator portion was more rigidly attached to the support pipe and air ports were positioned to assure balanced thrusts. Visual observation of the unit indicates the vibration problem has been corrected. Data from strain gauges attached to the unit are being evaluated. Heat up of the tank is continuing at the maximum rate of 30 F per day as limited by tank thermal stress considerations. A bulk solution temperature of 1500 F and a condensate rate of 2.5 gallons per minute was achieved by month-end.

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b. Fission Products Recovery

The strontium lead carrier sulfate precipitation process employs a centrifugation step to remove miscellaneous solids from the high-level waste prior to the sulfate strike. Evaluation of the ratio of cerium and strontium to cesium in the HAW stream as compared to the same ratios in centrifuged denitrated high-level waste indicates that substantial amounts of strontium and rare earth accompany the solids. Leaching the solids in the centrifuge with 4M nitric acid was tested in an attempt to reclaim additional strontium and rare earths. The leach was found to be relatively ineffective.

c. Aged Promethium Recovery

Flowsheets were successfully modified to remove manganese and cerium from the aged promethium. Manganese was removed by precipitating the rare earths with sulfate, leaving the manganese in solution. The rare earths were dissolved in HEDTA and purified by solvent extraction with D2EHPA. Cerium decontamination was effected by silver-catalysed oxidation with persulfate to retain tetravalent cerium in the solvent. Decontamination factors for manganese, iron, lead and cerium were 50, 20, 60 and 6, respectively. Over-all promethium yields were only 50 per cent primarily because of the prolonged and complicated processing to remove manganese. The presence of some residual manganese is also believed responsible for the less than normal cerium removal. Final processing for removal of sulfate, introduced as persulfate during the cerium removal step, is in progress at month-end.

3. Plutonium Process Engineeringa. Pu-Th-U

Solvent extraction flowsheet studies were completed by Battelle-Northwest in conjunction with Plutonium Process Engineering. The flowsheet conditions tested were as presented in HW-79672, "Pu-Th-U Partitioning Flowsheet and Equipment Specifications", L. E. Bruns, December 20, 1963. The reflux flowsheets, with some adaptations, were found to be workable. A solvent consisting of tributyl phosphate in carbon tetrachloride gave effective separation under some reflux conditions. Di butyl butyl phosphonate was operable but gave inferior performance. The separation of plutonium from thorium-uranium could be effected without reflux if uranium recovery was not desired. If uranium recovery were also desired, a reflux plus recycle flowsheet could be adapted, although a dilution and reconcentration of the TBP solvent would be desirable on each pass.

4. Separations Chemistry Laboratorya. Purex F-8 Sludge Dissolution

A sample was procured of the sludge in the Purex miscellaneous waste tank (F-8) to determine its solubility in solutions compatible with the Purex process. Satisfactory results were achieved in the laboratory with 6M HNO₃ at 100° C and using a three hour digestion period. Under these conditions, greater than 95 per cent of the solids and associated product were rendered soluble.

b. Separation of Lead from Rare Earths

The occasional inability to separate lead from the rare earth fraction during fission product processing has been largely overcome through laboratory work which has more closely defined the parameters affecting lead solubility. Laboratory work has permitted the preparation of a solubility curve for operational use which relates lead solubility to the lead concentration, the sodium hydroxide concentration, and to the temperature. It appears that in some cases the solubility of sodium plumbite had been exceeded in which case lead monoxide will precipitate.

c. Radiolysis of Promethium Product

Six days after stripping from the chromatographic ion exchange columns with DTPA, the promethium product solution developed a pink precipitate. After 21 days, the pink precipitate had redissolved to a clear solution. This has been interpreted as radiolysis of the DTPA to an oxalate, thus precipitating the insoluble promethium oxalate. Subsequent radiolysis of the oxalate may explain the final clear solution.

d. Americium Purification

The first attempt at chromatographic purification of significant quantities of americium nitrate solutions was made during the month. Approximately 75 grams were pH adjusted and loaded on Dowex 50 x 8 cation resin. The high aluminum content in the feed loaded the column when only one-third of the feed batch had been processed to the column. Elution with .027M DTPA at pH 4.5 was then started and 25 grams of americium were collected in the product cut for further processing to the oxide. The separation of Am from iron and plutonium appeared to have been very satisfactory, however, the product still contained about 10 per cent aluminum. The processing step through oxalate precipitation will be carefully observed to find out how much americium separation from aluminum can be achieved at this point. Some process changes appear to be required to provide better aluminum removal, preferably prior to column loading since the aluminum is capacity limiting.

The effect of aluminum on the americium distribution ratio on Dowex 50 was determined. In the absence of aluminum, americium had a "D" of 2400 (Am per unit of resin/Am per unit of solution). As the milliequivalents of aluminum were increased to .6 that of the americium, the "D" dropped to 2240 and decreased steadily as the aluminum was increased until it had dropped to 18 in the presence of excess Al. The addition of fluoride as a complexant was beneficial but the improvement was not considered adequate.

e. Thorium Analytical Methods

Presently available thorium methods which are sensitive only in the microgram range, or above, are inadequate to meet the needs of future thorium processing. Considerable effort has been expended in a search for a sensitive spectrophotometric method that could be adapted to routine laboratory use. A morin method was found to be somewhat better than the thoron method in sensitivity but was considered much too complex for routine work. Further work is underway.

DECLASSIFIEDf. Anticoincidence Guard

A 24 inch plastic scintillation detector has been installed around a 5 x 5 inch NaI(Tl) detector and the entire unit encased in a 4 inch lead shield. This scintillator will be used as an anticoincidence guard to permit the rejection of all coincidence counts during gamma counting. The effects of cosmic radiation will be eliminated and Compton and background effects will be greatly reduced.

5. Plutonium Chemistry Laboratorya. Recovery of PuO₂-Polystyrene Cubes

This work was initiated to find a solvent and procedure for the dissolution of polystyrene from the PuO₂-plastic cubes used in criticality experiments. Of the several solvents tried, the most effective solvent is chloroform. Pieces of polystyrene measuring up to 1/2" - 5/8" in any dimension were dissolved within eight hours in an agitated solution at room temperature. A convenient volume-to-solids ratio was one liter to 150 grams of material. This ratio could probably be reduced, if necessary.

b. Plutonium Recovery from Recuplex R&B Floor Sludge

Plutonium was successfully recovered from dissolved sludge using a typical Reclamation Facility solvent extraction flowsheet in batch studies. Plutonium extraction coefficients of 16 - 19 were observed for the extraction stage--0.6 - 1.2 for the first strip stage and 0.3 - 0.5 for the second strip stage; and 0.02 - 0.06 for the HF organic wash. Excellent plutonium cleanup in the organic phase was observed using a 5 weight per cent carbonate wash. Scrubbing the aqueous extraction feed with CCl₄ prior to extraction had limited (≈ 10%) effect on improving solvent extraction performance.

R. E. Tomlinson

Manager
Research and Engineering

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III. PERSONNEL ACTIVITIES

A. FORCE SUMMARY

<u>Operation</u>	<u>Monthly Salaried</u>		<u>Weekly Salaried</u>		<u>Total</u>	
	<u>2-28-65</u>	<u>3-28-65</u>	<u>2-28-65</u>	<u>3-28-65</u>	<u>2-28-65</u>	<u>3-28-65</u>
General Manager's Group	10	10	1	1	11	11
Financial	19	22	29	30	48	52
Employee Relations	3	3	3	4	6	7
Research & Engineering	60	61	27	27	87	88
Facilities Engineering	97	94	200	201	297	295
Production	6	6	3	3	9	9
Redox	62	61	225	223	287	284
Purex	69	70	275	278	344	348
Weapons Manufacturing	<u>57</u>	<u>58</u>	<u>250</u>	<u>245</u>	<u>307</u>	<u>303</u>
Total	<u>383</u>	<u>385</u>	<u>1013</u>	<u>1012</u>	<u>1396</u>	<u>1397</u>

B. PERSONNEL CHANGES

Effective March 1, R. E. Isaacson, formerly Manager - Redox Process Engineering, R&EO, was reassigned to the position Manager - Technological and Environmental Safety.

E. M. Johnston, Consulting Engineer, FEO, transferred to Picayune, Mississippi, effective March 5.

Effective March 16, O. F. Hill was employed by CPD, reporting to the Manager - Research and Engineering as Principal Chemical Engineer.

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C. TRIPS

<u>Visitor</u>	<u>To</u>	<u>Nature of Discussion</u>
<u>To Other G.E. Components</u>		
A. E. Smith	Advanced Technology Services Schenectady, New York	Consultation on laser welding. (3/15/65)
<u>To AEC and Other AEC Contractors</u>		
L. R. Michels L. D. Lash	Mound Laboratory Miamisburg, Ohio	Polonium technology. (3/8/65)
	Savannah River Laboratory Aiken, South Carolina	Polonium technology. (3/9/65)
W. P. McCue	US-AEC Washington, D.C.	Classification symposium. (3/15/65)
P. J. Wiater	Naval Reactor Facilities Arco, Idaho	Shippingport blanket fuel element dis- assembly. (3/21,22,23/65)
R. L. Walser D. C. Nelson	E. I. du Pont Savannah River Plant Aiken, South Carolina	Button line facilities. (3/22,23/65)
	Dow Chemical Co Rocky Flats Plant Denver, Colorado	Ditto above. (3/24,25/65)
J. B. Kendall	Oak Ridge National Laboratory Oak Ridge, Tennessee	Uranium specifications from power fuels. (3/29/65)
L. N. Sparks	US-AEC Washington, D.C.	200-W Shops Material Program. (3/30/65)
<u>To General Industry</u>		
A. J. Scott	Atomics International Canoga Park, California	U-233 Program. (3/11/65)
	General Atomics San Diego, California	Ditto above (3/12/65)
M. E. Yates J. W. Vinyard	Fansteel Metallurgical Corp. Torrance, California	Design and fabrication of process equipment. (3/21-23/65)

C. TRIPS (Continued)

<u>Visitor</u>	<u>To</u>	<u>Nature of Discussion</u>
<u>To Conventions & General Meetings</u>		
A. E. Smith	Philadelphia, Pennsylvania	Attend American Ordnance Association Twelfth Annual Standards Meeting. (3/19/65)

D. VISITORS

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From Other G.E. Components</u>		
Dr. J. V. Grimaldi	General Electric Company New York, N.Y.	Hazards Identification and Risk Control. (3/11/65)
<u>From AEC & Other AEC Contractors</u>		
W. P. Palica R. Fielding	Phillips Petroleum Co. Idaho Falls, Idaho	Neptunium process technology and resin hazards. (3/16/65)
R. L. Nelson L. W. Pribila	Dow Chemical Co. Rocky Flats Denver, Colorado	Specification interpretation. (3/17/65)
N. H. Van Wie W. L. Kephart	Oak Ridge National Laboratory Union Carbide Nuclear Co. Oak Ridge, Tennessee	Purex plant tour. (3/19/65)
M. McDonough	AEC-DIA Washington, D.C.	Euratom plutonium. (3/29 - 4/1/65)
L. M. Sparks	AEC, Office of Controller Washington, D.C.	Machine tool work. (3/30/65)
George Graves Jack Clark L. F. Murphy D. Thomas George Jordy	US-AEC Washington, D.C.	Purex tour. (3/31/65)
<u>From General Industry</u>		
R. P. Wischow	Martin-Marietta Corp. Baltimore, Maryland	Fission Products Quality. (3/3/65)

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D. VISITORS (Continued)

<u>Visitor</u>	<u>From</u>	<u>Nature of Discussion</u>
<u>From General Industry (Continued)</u>		
R. W. Kupp H. G. Tepp H. F. Richardson C. W. Wamser M. Selman H. O. Trout R. I. Newman	S. M. Stoller Associates Allied Chemical Corp. Morristown, New Jersey	Chemical processing. Purex plant tour. (3/29/65)
F. M. Cain W. L. Allison	Numac Company California	Tour of 2706-W and briefing on decontami- nation. (3/11/65)
T. S. Maples	R. I. D. L. Office, Seattle, Washington	Modification of R.I.D.L. Scalers. (3/12/65)
Ken Newman	Turco Products Burbank, California	Decontamination chemicals. (3/16/65)
Frank Morris	Turco Products Spokane, Washington	Ditto above.
R. H. Studebaker	Process Equipment Company Tipp City, Ohio	Tests of Remote Welder. (3/29/65)
E. T. Peek	Beckman Instrument Company Spokane, Washington	Inspection of Beckman Instruments. (3/29,30/65)
<u>From Other Federal & State Agencies</u>		
T. W. BATTERY	U.S. Air Force Washington, D.C.	Purex plant tour. (3/9/65)
<u>From Foreign Governments & Agencies</u>		
Lothar Koch Jeanne-Claude Mars	Euratom Karlsruhe, Germany	Euratom plutonium. (3/29 - 4/1/65)

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IV. SAFETY AND SECURITY

<u>Operation</u>	<u>General</u>	<u>Purex</u>	<u>WMO</u>	<u>FEO</u>	<u>Redox</u>	<u>R&E</u>	<u>Finance</u>	<u>Prod.</u>	<u>Empl. Rel.</u>	<u>Total</u>	<u>YTD</u>
Dis. Injuries										0	0
Ser. Accidents										0	1
Med. Treat. Inj.		14	10	15	11		2			52	126
Rad. Occurrences		4	3		4					11	28
Contam. Wds.		1			3					4	11
New Deposition Cases										0	0
Fires										0	0
Security Violations				1						1	4

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V. REPORTS

A. PREPARED AND ISSUED

- RL-SEP-58, Unclassified, "Project Proposal, Plutonium Concentration and Storage Facilities - "L" Cell - Purex", (Project CGC-172), by L. W. Finch, dated February 24, 1965
- RL-SEP-60, Unclassified, "Design Criteria - Analytical Laboratory Ventilation Changes - 234-5 Building", by M. E. Borgeson, dated November 4, 1964.
- RL-SEP-232 L21, Secret, "Button Purity Data - Letter No. 21", by R. J. Sloat, dated March 4, 1965.
- RL-SEP-232 L22, Secret, Ditto above, by R. J. Sloat, dated March 16, 1965.
- RL-SEP-232 L23, Secret, Ditto above, by R. J. Sloat, dated March 31, 1965.
- RL-SEP-267 PT2, Unclassified, "Part II Engineering Study, Thorium Processing-Purex", by R. D. Ehrlich and J. R. LaRiviere, dated March 19, 1965.
- RL-SEP-312, Secret AWD, "Semi-Annual Report - 03 Process Development July 1, 1964 to December 1, 1964", by R. E. Tomlinson, dated February 15, 1965.
- RL-SEP-318, Unclassified, "Critical Mass Control Specification for the Transfer, Handling, and Storage of U-233 in the 224-T Building", by H. A. Moulthrop, dated February 15, 1965.
- RL-SEP-321, Unclassified, "Critical Mass Control Specification - Room 27, 236-Z Building", by R. J. Sloat, dated March 10, 1965.
- RL-SEP-325, Secret AWD, "Semi-Annual Progress Report - 03 R&D July 1, 1964 to December 1, 1964", by R. E. Tomlinson, dated February 18, 1965.
- RL-SEP-339 RD, Secret, "Purex, Redox, UO₃ Production Schedules, March, 1965" by D. McDonald, Dated March 3, 1965
- RL-SEP-340 RD, Secret, "234-5 Production Schedule, March, 1965", by D. McDonald, dated March 2, 1965.
- RL-SEP-348, Secret AWD, "Weapons Process Engineering Technology Report - February 1965", by members of the Weapons Process Engineering Operation, Research and Engineering Operation, dated March 3, 1965.

A. PREPARED AND ISSUED (Continued)

RL-SEP-349, Unclassified, "Hazards Review Ion Exchange Purification of Americium-241 In the 222-S Building, 1-F Cubicle", by C. W. Nilsen, W. H. Braymen, J. S. Buckingham, R. D. Carter, dated March 5, 1965.

RL-SEP-358, Unclassified, "Process Design Engineering-Waste Management Program-Phase II, Rev. #4", (Project CAC-981) , by J. B. Fecht, dated March 10, 1965.

RL-SEP-360, Secret, "Skull Formation During Casting - Correlation and Applications", by R. H. Bond, dated March 15, 1965.

RL-SEP-361, Confidential, "FPT-65-2 Tensile Machine Installation Checkout", by J. F. Berggren, dated March 11, 1965.

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DECLASSIFIEDA. PREPARED AND ISSUED (Continued)

RL-SEP-393, Unclassified, "Plutonium Process Engineering Button Line Programs", by R. L. Walser, dated March 31, 1965.

B. PREPARED FOR SIGNATURE AND ISSUANCE

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CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

MARCH, 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

J. N. McCoy

TITLE

Chip Reduction Parting Tool
With Spring Loaded Cap
Release

General Manager
Chemical Processing Department

DECLASSIFIED

**DATE
FILMED**

2 / 5 / 93