RL-SEP-282

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CHEMICAL PROCESSING DEPARTMENT MONTHLY REPORT FOR JANUARY, 1965

RL-SEP--282

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Compiled By
OPERATION MANAGERS

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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
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I. SUMMARY

January production, as a percent of the HAPO Production Forecast (RL-GEN-9), is summarized below:

	January	Fiscal Year To Date
Separated plutonium nitrate	106	100
Separated uranium nitrate	101	100
Uranium oxide	101	100
Plutonium metal buttons	98	100
Fabricated parts	99	100

January production met forecasted quantities for all products.

The entire month of January was used by Purex for a thorium test run. By the end of the month, thoria dissolution had been completed, the uranium-233 had been recovered, a small amount of protactinium-233 had been recovered, and decontamination and purification of the thorium was under way. While the 40-hour solvent extraction campaign was too short to search for optimum processing conditions, nevertheless, more than 88 percent of the uranium-233 charged into the plant was recovered in a useful form. Valuable technical and operating information was also obtained concerning flushing requirements, dissolution of thoria, and solvent extraction, as well as decontamination and purification of protactinium-233 and uranium-233.

Tests indicated that one section of the new Purex ventilation filter, which was placed in parallel service with the old filter on January 15, was packed with glass fibers to a lower density than that specified in the design criteria. Accordingly, the initial over-all efficiency is expected to be only 99.6 percent rather than the 99.9 percent originally planned.

Four casks were loaded with a combined total of 218 kilocuries of cesium-137 and shipped to the Oak Ridge National Laboratory on January 18.

Following the record performance last month, Redox was shut down for four days to: 1) accumulate and store the in-process inventory of neptunium; 2) wash the organic solvent to reduce nitroso compounds; 3) flush the

[redacted]

extraction columns to correct a flooding tendency; 4) install jumpers to provide Zirflex processing capability. E-metal processing was resumed on January 5.

At the Waste Treatment facility, over 54 grams of americium-241 have now been recovered and stored for future processing.

A rapid steam emission, commonly called a "bump", occurred in Tank 105-A, which contains the most recent high-level waste from Purex. This was the first "bump" ever detected in any Hanford waste storage tank while the recirculators were believed to have been in operation. No abnormal process conditions were noted prior to or following the incident.

Project Proposal CAC-169, "Sludge Removal and Waste Transfer - 200 East Area", was transmitted to RLOO-AEC on January 27.

J. H. Warren
General Manager
Chemical Processing Department

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS

A. PRODUCTION OPERATION

1. Production Statistics

a. Percent of Forecast(1) Achieved

	January	Fiscal Year to Date
Separated plutonium nitrate	106	100
Separated uranium nitrate	101	100
Uranium oxide	101	100
Plutonium metal buttons	98	100
Fabricated parts	99	100

b. Purex

	January	December
Uranium nitrate produced (tons)	0	118
Average production rate during operation (T/D)	0	22
Total waste loss (%)		
Plutonium	-	1.28
Uranium	-	0.40
On-line efficiency (%)	0	21

c. Redox

Uranium nitrate produced (tons)	233	321
Average production rate during operation (T/D)	10	12
Total waste loss (%)		
Plutonium	0.32	0.25
Uranium	0.19	0.22
On-line efficiency (%)	74	86

d. Uranium Reduction (tons)

Normal UO_3 loaded	0	556
Enriched UO_3 loaded	197	168
Normal UO_3 approved for storage	0	556
Enriched UO_3 approved for shipment	151	203
Normal UO_3 shipped	0	0
Enriched UO_3 shipped	101	203
Normal UNH backlog	76	76
Enriched UNH backlog	331	295

(1) RL-GEN-9

f. Power

	200-East	200-West
Raw water pumped (gpm)	7 312	5 453
Filtered water pumped (gpm)	785	1 372
Maximum steam generated (lbs./hr.)	150 000	162 000
Average steam generated (lbs./hr.)	105 000	138 000
Total steam generated (M lbs.)	78 046	102 826
Coal consumed (tons)	4 096	5 296

January production met forecasted quantities for all products.

J K Harmon

Acting Manager, Production

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2. FISSION PRODUCT DATA (Kilocuries)

	INVENTORIES									
	HEAD END	002-CR	003-CR	B-PLANT	SSW IN PROCESS	SSW PRODUCT	CASK	CONSIGNMENTS	RECOVERY	SHIPMENT
Sr-90			770(1)	1500		2220				
Pm-147 (Unaged)			2160(2)	4650						
Pm-147 (Aged)		190			330(3)			64(4)		
Cs-137									170	218

(1) Includes 380 Kilocurie pump and line heel.
(2) Includes 1060 Kilocuries pump and line heel.
(3) 20 Kilocurie process loss since last report.
(4) 11 Kilocurie process loss since last report.

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II. ACHIEVEMENTS (Continued)

B. PUREX OPERATION

1. Operating Continuity

The Thoria Process Test was initiated at the Purex Plant during January, 1965. The uranium-238 contaminated C-3 dissolver tower and knockout pot were replaced with a reclaimed system. Special lines were installed so that the condensate from the dissolver tower and knockout pot could be routed to the acid recovery system rather than recycled to the dissolver. The C3 dissolver was charged with the thoria fuel elements on January 11, 1965. Aluminum jacket removal was accomplished without incident.

Dissolution of the thoria fuel elements and acid removal from the thoria dissolver solution required approximately two weeks. Five 2200-gallon batches of 12.2 M nitric acid, 0.05 M aluminum nitrate, and 0.025 M potassium fluoride dissolved about 95 percent of the thoria present. The uranium-233 isotopic purity of the dissolver solution varied from 95 to 96 percent.

The recovery and purification of the uranium-233 in the dissolver solution, using two solvent extraction cycles, were accomplished during the period January 25, 1965 to January 28, 1965. The isotopic purity of the uranium-233 in the product solution was 95 to 96 percent, indicating no contamination occurred during the solvent extraction process. Thorium purification was initiated on January 29, 1965 and continued through the end of the month.

The recovery of protactinium-233 from the first batch of dissolver solution was moderately successful although a 50 percent loss of the protactinium product solution was experienced when a malfunction of the centrifuge cascade system occurred. The protactinium-233 product solution was loaded into a 400-gallon cask.

Two neptunium shipments (1310 grams total) were made during January, 1965.

The Purex Head End fission product recovery equipment was utilized for thoria processing during the month.

Promethium processing was resumed at the Strontium Semiworks on January 15, 1965. Laboratory development studies confirmed that manganese in the crude feed resulted in severe solvent overloading and prevented satisfactory rare earth extraction. A modified solvent extraction flowsheet requiring stringent pH control in the HA-HC

solvent extraction columns resulted in about 50 percent rare earth recovery and 75 percent manganese removal. A rework run recovered all except 15 kilocuries of the waste loss. A test run, using batch contact equipment, enabled better pH control and adequate contact times. The batch test run resulted in 95 percent rare earth recovery with 90 percent removal of the manganese. A second batch test run resulted in the precipitation of solids when the pH exceeded the flowsheet range of 1.6 to 2.0. Product recoveries, however, were comparable to the previous batch run (90 percent) but only 60 percent of the manganese was removed. Flowsheet optimization is still progressing with a third test run currently underway.

Warmup of Tank 101-BY with the In-Tank Waste Solidification unit was started on January 5, 1965. However, the unit was shut down on January 9, 1965 due to excessive motion of the circulator. Installation of permanent bracing for the circulator enabled round-the-clock operation of the unit starting January 20, 1965. Heating of Tank 101-BY is progressing at an average rate of 3° F per day. Off gas and condensate samples are well within specifications.

2. Processing Operation

There was no uranium or plutonium processing during January, 1965.

Loading of the four cesium casks was completed on January 12, 1965 and shipment to Oak Ridge Laboratory was made on January 18, 1965. The four casks contained a total of 218 kilocuries of cesium-137. The alternate cask effluent routing to the feed tank enabled a 13 percent higher loading than previous cask loadings without this routing.

3. Equipment Experience

The new Purex canyon air ventilation filter was placed in service on January 15, 1965 in parallel with the existing filter. Total differential pressure across the new filter was 1.9 inches of water and about 2.2 inches of water across the old filter. The initial overall filter efficiency is estimated at 99.6 percent, lower than the goal efficiency of 99.9 percent. Actual efficiency will increase as dust loads on the filter during operation.

Major work in L Cell (final plutonium package) at the Purex Plant included entries to repair leaks. A new section of line was welded in place on the E-L4 plutonium concentrator to repair a corrosion leak.

Comprehensive inspection and load testing of four 480-volt electrical breakers located in the east switchgear room was completed. 480 volt, 400 ampere temporary electrical service was provided to the J. A. Jones Construction Company, currently working on the Purex flexibility project in the 202-A Building.

The following main and secondary electrical feeder cables and electrical buses in the Purex Plant were tested during January: Main and secondary electrical feeder cables between the switching station north of the 202-A Building and the east switchgear room and the west switchgear room; and all main electrical buses. This electrical equipment was found to be in satisfactory condition.

New cables were installed on two 2400 to 480 volt emergency transformers. This work was done to eliminate deteriorated pot head bushings on these transformers.

An additional electrical reelite and new improved electrical controls for the jumper cutter and a 10-ton rotating hook were installed on the Purex west canyon crane to improve performance and dependability of this equipment.

A high pressure water pump and associated piping for both water and acid were installed in the Purex pipe and operating gallery with five branch pipe lines into the Purex canyon. This equipment will be used for decontamination work both in the canyon and railroad tunnel. The installation was performed by the J. A. Jones Company.

Two pump failures were experienced in U cell at the Purex Plant this report period; pumps U1-1 and U1-2. Both failures were due to mechanical difficulties. The pumps were replaced with reconditioned hot spares.

Pump XD-2 (acid absorption solution pump) located in the 293-A Building (backup facility - acid recovery)at the Purex Plant failed due to mechanical trouble. Replacement was made with a new pump from Spare Equipment.

The replacement of a demineralized water header between Tank 30 (demineralized water storage) located in the 211-A Area at the Purex Plant, and Tank 223 located on the third floor of the Chemical Makeup area was completed this month. The old removed header was aluminum pipe and the replaced header was 304-L stainless steel. Work was performed by the J. A. Jones Construction Company.

The discharge piping from the two XAF (XA column feed) pumps located in the N Cell (plutonium ion exchange unit) hood room was replaced. The old piping had deteriorated through long service and was no longer dependable.

The Purex canyon process pump located in Tank F12 failed because of low flow and excessive leakage at the top bearing. The pump was replaced with a reconditioned hot spare.

The failed titanium right hand tube bundle in E-F6 (high-level waste concentrator) at the Purex Plant was replaced with a stainless steel tube bundle.

The 3WB (waste backcycle system) jumpers in the Purex Plant were replaced with a magnetic flow meter system.

Construction work continued in B Plant with core drilling in Cell 13 for ventilation ducts, drilling in the Electrical Gallery for the viewing window to Cell 15, sand blasting in Cell 15, shielding in the pipe trench, and modifications to the chemical makeup areas.

The P-5 (HA column feed) pump was installed in A Cell at the Strontium Semiworks on January 11, 1965 after realignment of the process connector heads and jumper regasketing. During the same A Cell entry, television views of the failed P-7 (alternate HA column feed) pump revealed that the fingers of the electrical head are still engaged and that the hex drive nut is twisted off. The replacement of the P-7 pump will be made when processing conditions allow.

The failed east bank of the Strontium Semiworks vessel vent filters was replaced on January 19, 1965. Since switching to the new filters no appreciable stack emissions have been noted.

The agitator in Tank 11-1 in the B Plant canyon failed because of shorted electrical windings in the motor. Replacement was made with a reconditioned hot spare.

4. Radiation Experience

Iodine emission averaged about 0.10 curies per week.

Burial of the failed E-F6 concentrator in the old Purex burial tunnel was completed on January 22, 1965. Railroad tunnel contamination resulted from contaminated dust released from the concentrator during loading in the tunnel. The railroad tunnel and railroad cars associated with the burial have been cleaned.

A severe "bump" occurred in Tank 105-A on January 28, 1965, pressurizing the system and causing some minor personnel contamination and contaminated areas within the confines of the 241-A Tank Farm. Personnel decontamination was accomplished immediately. Decontamination of 241-A Tank Farm equipment and ground areas is in progress.

5. Analytical Experience

Major analytical support was provided for the Thoria Process Test at the Purex Plant, the In-Tank Waste Solidification Program, and the rare earth purification tests at the Strontium Semiworks.

Calibration work on the wide-beta counting instrument was completed for technetium-99, promethium-147, and phosphorus-32.

Calibration of the new "400" channel gamma analyzer has been completed for sixty-nine isotopes in miscellaneous isotopic matrices. The program has been automated with the data processing operation.

Manager-Purex

WM Harty:MLM:gt

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (Continued)

C. Redox Operation

1. Operating Continuity

The Redox plant was shut down the first four days of the month for: 1) accumulation and storage of the in-process neptunium inventory; 2) washing of the hexone inventory to reduce nitroso compounds; 3) dilute nitric acid flushing of the extraction columns to correct flooding conditions; 4) installation of process jumpers to provide an alternate routing for the 3DW stream; and, 5) new cell jumpers in A-dissolver cell to provide Zirflex processing capability. E-metal processing was resumed on January 5 and, although plant performance was somewhat below the high level experienced in December, when a new all-time monthly uranium production record for the Redox plant was achieved, the scheduled production for January was met.

The Uranium Oxide plant operated satisfactorily throughout the month and the enriched uranium production exceeded that expected. However, depleted uranium oxide production was below expectations due to a shortage of feed material.

2. Processing Operations

a. Redox Processing

Virgin E-metal processing, resumed on January 5, was interrupted on ten separate occasions for periods ranging from 45 minutes to slightly in excess of one day. Total plant down time during the scheduled operating period was approximately four days. Although the problems were diverse, all were readily resolved with the exception of one associated with the inability to maintain backcycle salt flow in sufficient volume to sustain either the 1A or 1S columns at the optimum rates demonstrated in December. Several steps were taken to improve the flow pattern which appeared to be impeded by the formation of solids. However, final improvement was not obtained until the D-14 backcycle waste pump jumpers were redesigned and subsequently installed on January 28, 1965. At month end processing was being maintained without difficulty.

Effective January 1, 1965, the process control function of the Redox Process Engineering Operation, Research and Engineering, was transferred to the Redox Processing Operation, Redox.

b. Uranium Oxide Processing

Operations in the Uranium Oxide plant were significantly curtailed this month due to the lack of depleted uranium feed. Processing was confined almost entirely to enriched uranium oxide production. It is anticipated that this condition will prevail until the latter part of February when depleted uranium feed should again become available.

3. Maintenance Experience

a. Redox Plant

Process outages related to equipment problems were confined to two pump failures and the loss of one canyon cell jumper, for an overall mechanical efficiency of 95.5 percent.

On January 5, an electrical fault occurred in the Redox bus bar duct between the 13.8-KV-2400 volt transformer and the 202-S Building switchgear room. The arcing caused a build-up of explosive gas mixtures in the ductwork which were ignited each time the breaker closed in the 251 substation. The bus bars were damaged for approximately 10 feet outside the 202-S Building. No injuries or serious effects on processing were experienced from the incident. Total cost of repairs was approximately $1700. The incident was investigated as CPD Serious Accident 65-1.

b. Uranium Oxide Plant

To provide a uniform feed rate to the X-6 hammermill and improve the particle size distribution of the final uranium oxide powder, regardless of the number of calciners operating, high and low level probes were installed in the X-5 cyclone separator and electrically connected to the rotary valve which feeds the hammermill. Preliminary results covering 20 hours of operation indicate satisfactory operation and final oxide powder has satisfactorily passed specification screen tests.

4. Waste Handling and Decontamination

Equipment valued at approximately $145,000 was received from customers for decontamination, repair, inspection or burial during the month. Equipment valued at approximately $288,000 was returned to customers, representing a savings of approximately $250,000 based on the cost of new equipment.

There have been no significant changes in radiation readings under the 107-SX and 108-SX waste tanks this month. A slight shifting of maximum radiation readings has occurred, with a minor increase of level readings under the 108-SX tank. No detectable change in waste volume inventory has been noted. Continued close surveillance is being maintained to permit timely action if required.

5. Radiation Experience

On January 4, 1965, the Redox Radiation Monitoring Operation assumed responsibility for two monitoring functions formerly performed by Hanford Laboratories; namely, 1) radiation protection services in Chemical Processing Department for the Hanford Utilities and Purchasing Operation and the Relations and Occupational Health Operation; and, 2) sampling of the Redox plant's 291-S stack effluent. This realignment of work functions was taken to develop self-sufficient monitoring capabilities in contemplation of the transfer of the Chemical Processing Department to a new contractor.

6. Analytical Experience

In addition to the usual analytical support provided the Redox and Uranium Oxide plants, the Redox Analytical Laboratory provided analytical services for numerous outside customers. This included, but was not limited to: 1) analytical support for control of the third promethium purification run conducted by the Separations Chemistry Laboratory; 2) polonium and bismuth determinations to evaluate a new separations flow scheme proposed by the Separations Chemistry Laboratory; 3) determination of activation products formed in flux monitors used in reactor test holes at the KE and KW facilities; and, 4) plutonium and uranium analyses to evaluate a dissolution study of refractory plutonium and uranium oxides for Battelle Northwest Laboratory.

S. G. Smolen
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 plutonium was normal. Operation of the recovery equipment was satisfactory except for the slag and crucible dissolver where approximately one week was lost due to failure of two of the Teflon-lined parts. The incinerator, the waste treatment facility and the americium recovery equipment all performed without significant interruptions.

2. Processing Operations

a. Plutonium Fabrication

Information on plutonium fabrication activities is presented in Document RL-SEP-306 (Atomic Weapon Data).

b. Plutonium Reduction

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

Thirty (30) kilograms of non-defense grade plutonium oxide were prepared for shipment to Euratom. The material was formally transferred to the Atomic Energy Commission but is being held at Z Plant pending final shipping release.

c. Plutonium Reclamation

One hundred fifty-five (155) kilograms of plutonium were delivered to the button line from the recovery facilities during the month.

One hundred twelve (112) boxes of waste and 21 packages of leachables were processed through the incinerator facility.

Testing of the 04 slag and crucible dissolver continued during the month. Two 100 can process tests were performed during the first three weeks and the vessel was down for the balance of the month for repairs.

c. Plutonium Reclamation (Continued)

One hundred eight (108) grams of plutonium were returned to the main process stream from 71,000 liters of waste which were processed through the waste treatment facility. Also, 9.1 grams of americium were recovered and stored for future processing. Total in storage is now 54.4 grams.

3. Mechanical Performance

Performance of the fabrication and inspection equipment was satisfactory except that it was necessary to replace the spindle bearings of the Gorton lathes in Hood HA-39; to replace the refrigeration compressor in the cold treatment hood, HC-23; and to repair the heating elements and thermocouple connections in the environmental hood, HI-73-E.

The button line equipment continued to require a substantial amount of maintenance effort. Major replacements involved the secondary fluorinator off-gas filter case, the inlet element of the fluorinator, and two panels on Hood 9-B.

Recovery equipment performance was satisfactory except for that of the 04 slag and crucible dissolver. In one case, the Teflon liner of the tee section above the liquid level bulged and prevented the slag and crucible cans from reaching proper position. In another case, the Teflon liner of the lower heating section failed and resulted in leakage. When the dissolver was dismantled, it was discovered that the steam sparger was plugged with solids and broken off at the tee section. Repairs were essentially complete at month end. Two Chempumps failed and were replaced with new spares and six others were removed from service for bearing replacements.

Inspection of the electrical busses between the main transformers and the 234-5 Building switchgear room revealed some deteriorated insulators. These were replaced and vapor barriers are to be installed to prevent similar damage in the future.

4. Radiation Experience

Radiation and contamination control statistics for January indicated satisfactory control.

One case of potential plutonium deposition was experienced when an operator, working in the sorting hood at the incinerator, incurred a puncture wound. Excision was successful in reducing the contamination to 1% MPBB.

5. Analytical Experience

Number of Samples Received	3,429
Number of Determinations	27,433

Both the emission and the mass spectrographic laboratories have been working closely with Purex personnel to identify the isotopic content of, and the impurities present in, the Uranium-233 currently being processed.

Calibration films have been prepared for the spectrographic determination of impurities in thorium dioxide. This program is in support of the preparation of U-233 and samples are to be received in early February.

During the month the new alpha energy analyzer was placed in routine service. Cross checks between this instrument, the one at Redox, and the TTA extraction alpha counting method showed excellent agreement for the analyses of americium and plutonium.

W J Gartin

Manager
Weapons Manufacturing

WJ Gartin:csj

CHEMICAL PROCESSING DEPARTMENT
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JANUARY, 1965

II. ACHIEVEMENTS (Continued)

E. FINANCIAL OPERATION

1. Production Cost Accounting

In connection with providing Battelle-Northwest with 0.5 to 1.0 megacuries of Pm-147 in FY 1965 on a lease basis ($50,000 charge), the RLOO-AEC Budget Office verbally advised that the Isotope Inventory production fund ceiling would be increased from $1,700,000 to $1,750,000.

A cost estimate was prepared for receiving, disassembly, and storage of Shippingport fuel elements in T-plant. This estimate was included in letter from M. K. Harmon to J. T. Christy, dated January 12, 1965, subject, "Shippingport Blanket Fuel Handling".

Detailed study was made of unit costs since FY 1960 which explained major reasons for unit cost reductions during this period. The report was submitted to Contract Accounting early in January, in compliance with AEC request for this data.

Purex costs for the month of January were booked to the U-233 test run. Charges of $32,000 were billed to IPD to cover incremental costs in connection with this effort.

2. General Accounting

As of December 31, 1964, nineteen active projects had incurred costs of $3,778,004 against authorized funds of $6,059,924. Outstanding commitments totaled $397,999.

During January one work authority was received from the AEC: Directive No. AEC-248, Work Authority No. 1, Project CAC-152, Purex Analytical Laboratory Additions, authorized $2,000.

There were twelve appropriation requests approved during January, 1965, authorizing expenditures of $134,240. The approved AR's are detailed as follows:

AR Number	Description	Section	Amount
56028	High Generator Sealing Bars	WMO	$ 7 500
56029	Teflon Gasket Head Assembly	Redox	5 790
56030	Detection and Alarm System - T-plant	WMO	9 500
56031	Shielded Crystal Holder - Multichannel Anal.	Purex	4 600
56032	Critically Safe Sump Capacity - Hood 6	WMO	10 000
56033	Pu Nitrate Receiver Tanks - Room 166	WMO	49 500
56034	Mass Spectrometer	FEO	8 000
56035	Modify Two Power Rolls	FEO	850
56036	Drilling and Tapping Machine	FEO	5 000
56037	Flame Spectrophotometer	Redox	5 000
56038	Dampers for Purex Exhaust Fans	Purex	25 000
56039	Gas Chromatograph	Redox	3 500

3. Auditing

An audit of CPD off-site training activities was completed. The audit is part of a current AEC-wide audit of off-site training provided in FY 1964 for employees of AEC and AEC contractors.

A review was made of CPD purchase order commitments outstanding as of January 25, 1965, numbering 400 orders, for a total value of approximately $1,676,400. It appears that two to three of these orders can result in lengthy negotiation and/or litigation. Close follow-up will be continued to minimize problems in this area with transfer of CPD to new contractor.

An audit memorandum relating to spare equipment and parts in exterior storage was directed to section managers and Purchasing and Stores management. Agreement was reached that prompt action would be taken to upgrade protection of these items in accordance with specifications recently developed by FEO.

4. Personnel Accounting

Functional charts and position guides were prepared and approved for the Financial component under the CPD segmented operation.

5. Business Programs

At the request of the Commission, estimated cost of processing, storing and perpetual care of 100,000 gallons of private radioactive waste was submitted to RLOO-AEC.

R G Connelly
Manager - Finance

CHEMICAL PROCESSING DEPARTMENT
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II. ACHIEVEMENTS (continued)

F. FACILITIES ENGINEERING OPERATION

1. Purex

Large Pulse Generators

The vendor for Purex pulse generators has been instructed to proceed with fabrication of two (2) short-stroke machines using a new one-piece welded construction. Although each unit will cost $2,000 more, the extra cost is justified by elimination of flange leaks.

Purex Processing Flexibility

On January 4, the Atomic Energy Commission approved Revision No. 2 of the design criteria, covering dissolver modifications required for thoria dissolution. On January 21, the Directive (EQT-009) was modified to authorize a ring-type air sparger with lift tubes to improve thoria dissolution. Design review work included sixty-nine (69) drawings and five (5) specifications. Thirty-six (36) jumpers were fabricated in the Shops for this project (CGC-124).

Purex 4.0 Capacity Factor Expansion

Calculations to establish Purex equipment requirements for the 4.0 Capacity Factor process were continued. These calculations were completed for ten (10) of the fifteen (15) equipment pieces or systems which could limit plant capacity. The information obtained to-date indicates these tentative conclusions:

a. New, larger tube bundles are required for Concentrators E-EF6, E-J8, and E-K4. The accompanying condensers and related equipment are adequate within specific conditions of condenser vent vacuum and cooling water outlet temperatures.

b. Concentrators E-J8 and E-K4 could be placed on a separate vent system, thus increasing the vacuum on the present system.

c. Additional air requirement will require the installation of additional compressor capacity.

3 WB Magnetic Flowmeters

The 3 WB (Backcycle) magnetic flowmeter systems were installed in the Purex Canyon on January 19. During the systems evaluations, one was found to be operating satisfactorily in every phase while the other was found to be inoperative. A preliminary investigation indicated that the failure was in the in-canyon

equipment, probably a cracked lining for the meter. The investigations will continue as soon as process operations will allow.

X-Ray Photometer

Because of the instrument's age, replacement X-Ray heads are no longer available for the photometer in the Purex laboratory. A small, compatible X-Ray head, used in dentistry, was procured and installed. After the initial de-bugging, the modified photometer is operating satisfactorily.

CAC-152 - Purex Analytical Laboratory

Dir. No. AEC-248, dated January 18, authorized $60,000 for design of the proposed work.

Purex Dissolver Off-gas Tower Renovation

The repair, testing, and as-builting of a contaminated Purex dissolver off-gas tower and knockout pot in the 221-T Canyon, was completed on a crash basis in sixty-four (64) hours, without incident and was installed in the Purex plant.

2. Redox

Redox Dissolver Modifications

Design and specifications of equipment for Redox annular dissolvers were modified for the processing of PRTR moxtyl fuels. The modifications provide control of the coil surface at 176°F., thus minimizing corrosion of the dissolver coil while processing this type of fuel.

D-14 Backcycle Concentrator

The process design of an external cooler for Redox D-14 concentrator has been completed. Design criteria will be issued when the sampling problem has been solved.

Liquid Level Reel

Design was completed on a liquid level reel for all non-boiling waste tanks in the 200 Areas. Approximately ninety (90) reels will be required.

Jumper Fabrication

Nine (9) Redox jumpers were fabricated, six (6) of which were done on an emergency basis. Ten (10) jumpers are being fabricated for the new LN Column (Neptunium Extraction).

3. Weapons

Plutonium Chemistry Laboratory

The general purpose glove boxes in Rooms 179-C and 145 are both in service. Piping has been installed to route ventilation exhaust air from 179-B and 179-C through a secondary filter box.

Dry Air System

The new dry air control system has been operated successfully for several days, thus indicating that it is a reliable system. Additional modifications are being made to the controls so that either system can be used as a back-up to the other.

Plutonium Reclamation

Detail design was completed for an off-gas scrubber installation for the Miscellaneous Treatment Room. The scrubber is expected to eliminate the problem of extremely wet glove box atmosphere. A spare dissolver heater has been fabricated and prepared for installation when needed.

"C" Button Line

Engineering is nearly completed and drafting well underway on the design of the new receiving hood that will assist in the accountability of the materials flowing into the button line. The design of the HC-6 overflow sump was approved and construction started. The engineering study of Hoods HC-7 and HC-9B is proceeding on the basis of continued utilization of the precipitation process.

Incinerator

Vendors are being sought for the casting of a new cyclone assembly for the incinerator furnace. This search includes the possibility of procuring the components off-site and welding them in the CPD Shops. Engineering studies have been completed to select materials and design modifications for the furnace conveyor belt. On the basis of these studies, a 10-gage Nichrome "V" wire mesh belt was recommended.

Sheffield Gage

A design was prepared for "two-piece" holding fingers for the Sheffield Rotocomm gages in Inspection. This design allows quick change from short to long fingers - or the reverse - and will save set-up time.

Pressure Recorder - Hydraulic Rams

Installation was completed of a fast response pressure recorder

on a hydraulic press used for preparation of plutonium blanks. The operation is satisfactory with press pressure recorded throughout the punch cycle, which takes about one (1) second.

Plutonium Testing

The "cookie slicer" for cutting test specimens of plutonium was completed by the CPD Shops.

4. General

Waste Management

Review of detail design drawings was continued for both Phase II and Phase III. Information was received which indicates an effective life of at least 2.5 years for the proposed installation (Phase II) at a flow of 75,000 cfm.

The design criteria document on integration of the FPCE and Waste Management was transmitted to the Commission on January 21. The addition of Americium recovery capability to the FPCE Plant Promethium chromotography facilities appears economically very attractive. Also, the recovery of Neptunium and Plutonium from sludge wastes in 221-B and 224-B appears attractive. Preparation of design criteria for sludge waste is proceeding, with an eventual goal of possible start-up concurrent with Phase III Waste Management start-up.

Prototype Packaging Equipment

The vendor has done some testing on the manipulator, and has the handling mechanism ready for testing. The "buyer's" tests are expected to begin on February 5. Fabrication of the air lock was completed, and the component's discrepancies are being corrected. Design of the container neck has been modified to prevent pressurizing the container with water being heated by the "waste" product. Testing of the loading and drying station equipment was continued. Parts are being machined and reassembled in the CPD Shops mock-up.

200-East Area Water Conservation

The study has been completed and is being prepared for issue. The primary conclusion is that if all possible conservation measures were employed, Purex could be operated at 3.6 Capacity Factor and the "B" Plant Phase III program at design capacity without constructing a new export line. Otherwise, to supply all known and projected needs in 200-East Area a new export line would be needed.

Water Conservation

Several actions to conserve water were initiated. An estimated saving of 15,000 gallons per day was made by modifying cooling water service to the furnace stokers and dead plates in both powerhouses. Calibrated orifices were installed in the 200-East general are high tank in order to maintain overflow water at a minimum. All high tanks will be equipped with these orifices. Further consideration is being given to obtaining larger pumps from Irradiation Processing Department for use in 282-E Building.

Spare Parts Inventory and Control System

Technical improvements were installed during January which gave almost total system flexibility to spare parts control. These controls may be exercised at department, section, or foreman level, thus varying from broad policy to individual item controls. A users and programmers manual is being prepared.

Changes of Responsibilities

Shops Operation assumed the additional responsibilities for providing radiation monitoring services in the 200 Areas, as required by Electrical Distribution, Transportation, Purchasing, Stores, and in the BC Crib Area in 200-East Area for Battelle-Northwest Laboratory.

Project Data

Project Cost Information - as of 1/31/65

Total Authorized Funds-20 active projects	$ 6 101 000
Total Cost-to-date	3 913 000
Commitments and Open Work Releases	1 012 000
Unencumbered Balance	1 176 000
Costs Charged to Above Projects 1/3/65 to 1/31/65	135 000

CAC-169 - Sludge Removal and Waste Transfer Facilities-200-East Area

A preliminary project proposal was transmitted to the Commission on January 27. The proposal requested authorization of $250,000 for design of the facilities based on the new transfer vault concept.

CAC-162 - "B" Plant - Semiworks Transfer System - 200-E Area

A project proposal requesting authorization to provide facilities for transfer of waste solutions between "B" Plant

and the Semiworks was transmitted to RLOO on January 12. This project proposal was presented to RLOO along with a request for a prototypical chromatographic ion exchange unit for the Semiworks.

Manager - Facilities Engineering

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II. ACHIEVEMENTS (Continued)

G. RESEARCH AND ENGINEERING OPERATION

1. Purex Process Engineering

a. Thorium Process Test

Dissolver Flushing

After establishing that the off-gas lines in the C3 dissolver represented a source of uranium contamination to thoria dissolving, the by-pass system (including the dissolver tower, knock-out pot, and ammonia scrubber) was removed to avoid potential difficulties associated with ruthenium volatilization and condensation in the off-gas filters. The system was replaced with a reclaimed dissolver tower and knock-out pot and the ammonia scrubber previously in service. Preliminary flushes of the reclaimed tower and knock-out pot revealed the system was grossly contaminated with normal uranium. Special lines were installed so that the condensate from the tower and knock-out pot during thoria dissolution could be routed to the acid recovery system rather than being recycled to the dissolver.

Thoria Dejacketing

After charging the five ton lot of irradiated thoria target elements to the C3 dissolver, the aluminum jackets were removed by caustic dissolution in a sodium nitrate medium without incident. About 200 pounds of thoria was recovered by centrifugation of the coating waste solution. The dejacketing operation was conducted at 90° C in order to minimize uranium contamination from the solution returning to the dissolver pot from the contaminated downdraft condenser and knock-out pot. The low temperature operation was not successful in avoiding condensate formation and resulted in a uranium-233 isotopic purity of only 55 per cent in the uranium recovered from the coating waste solution. The low quality material was discarded.

Thoria Dissolution

About 95 per cent of the 10,500 pounds of thoria remaining after coating removal was dissolved in five 2200 gallon batches of 12.2M HNO_3, 0.05M ANN, and 0.025M KF. A total dissolution time of 215 hours was required and the average dissolution rate

was about one pound of thoria per hour per square foot (assumes the thoria was evenly distributed over the 50 square foot bottom of the dissolver). During the dissolution, the condensate from the downdraft condenser and knock-out pot was routed to the Acid Recovery System to avoid contaminating the dissolver solution with uranium-238. The uranium-233 isotopic purity of the dissolver solution varied from 95 to 96 per cent.

Acid Boil-Off

The acid was removed from the dissolver solution by concentrating to about 1.4M Th, followed by steam sparging and repetitive water additions and boil-downs. The operation required 24 to 36 hours and resulted in a hydrogen to thorium mole ratio of 1.0 to 1.5.

Protactinium Recovery

The first batch of dissolver solution after acid boil-off was adjusted to about 1.0M Th, 1.0M HNO_3, and 0.1M sulfamic acid. A reverse permanganate strike was made, forming about 70 pounds of MnO_2 for protactinium removal. The strike successfully removed 85 - 90 per cent of the protactinium-233 and zirconium-niobium-95. The strike also carried about two per cent of the thorium and uranium. The manganese dioxide was dissolved in a nitric acid-sugar medium at 90° C and the resulting solution was recentrifuged to remove insoluble barium sulfate. During this operation, a malfunction of the centrifuge cascade system caused a 50 per cent loss of the protactinium solution to the solvent extraction feed make-up tank. In addition, during this operation much of the protactinium-233 product was apparently lost by an incomplete removal of the manganese dioxide heel from the centrifuge feed tank. A second reverse permanganate strike was successfully made to reduce the thorium and uranium-233 of the protactinium product. The final 3- 10 gram protactinium-233 product was loaded into a 400 gallon (30 ton) solution cask in a 0.1M H_2SO_4 - 0.01M $Fe(NO_3)_3$ medium.

Uranium-233 Recovery and Purification

The recovery and purification of the uranium-233 in the irradiated thoria was achieved by two solvent extraction cycles using 5 per cent tributyl phosphate in Soltrol-170. The seven-inch diameter pulse columns normally used for neptunium and plutonium decontamination were used for uranium-233 recovery. A brief summary of the two flowsheets and their performance are shown in Table I, II, and III below. The run required about 40 hours of operation, so that the short duration of equilibrium conditions provided no opportunity for study of flowsheet variables. Essentially no downgrading of the uranium-233 product with uranium-238 occurred across the two solvent extraction systems. The uranium-233 product quality with respect to other contaminants is shown in Table IV.

TABLE I
RELATIVE STREAM FLOWS FOR U-233 PROCESSING

First Cycle		Second Cycle	
1AF	= 100	2AF	= 55
1AX	= 60	2AX	= 24
1AS	= 30	2AS	= 12
1CX	= 30	2CX	= 12

TABLE II
STREAM COMPOSITIONS FOR U-233 PROCESSING

	1AF	1AS	1AX	1CX	2AF	2AX	2AS	2CX
HNO_3 M	-0.1			.05	3.5		1.0	.01
TNT M	0.7							
ANN M	0.07	0.5						
$NaNO_3$ M	1.1							
TBP Vol %			5			5		

TABLE III
PROCESS PERFORMANCE FOR U-233 PROCESSING

	First Cycle	Second Cycle	Overall
A Column Loss %	0.2 - 0.6	3 - 10	7
C Column Loss %	0.05 - 0.10	0.05 - 0.10	1.0
Thorium DF	150	150	2×10^4
Pa DF	10,000	2,000	2×10^7
ZrNb DF	7,000	400	3×10^6
Ru DF	4,000	400	1.5×10^6

TABLE IV
TYPICAL U-233 PRODUCT QUALITY

Uranium Isotopes (Wt %)	U-232	2.1 to 2.8 ppm
	U-233	95 - 96
	U-234	0.55 - 0.65
	U-235 + U-238	4.0 to 4.5
Pu (gram/gram U-233)		.001 - 0.002
Th (gram/gram U-233)		.08 - 0.12
Pa-233 (uc/gram U-233)		5 - 15
ZrNb-95 (uc/gram U-233)		0.8
Ru-103 - RuRh-106 (uc/gram U-233)		0.8

b. Canyon Ventilation Filter

The new Purex canyon ventilation filter was placed in service in parallel with the existing filter on January 15, 1965. In a series of operability tests made before accepting the filter for startup, the measured pressure differentials for the forefilter checked anticipated values, but the data for the afterfilter were consistenly below estimates derived from pilot plant and manufacturer values. Pressure drop and DOP filtration efficiency tests with a mock-up afterfilter section confirmed the low pressure drop measurements and efficiency estimates. The test data indicate the packing density in the afterfilter is less than the 1.2 lb/ft^3 specified in the design criteria so that the initial over-all efficiency will be an estimated 99.6 per cent rather than the 99.9 per cent originally targetted.

2. Redox Process Engineering

a. Gamma Activity Measurements

All gamma analyses on Redox process streams are now determined as microcuries of specific fission products by gamma energy analysis. Heretofore, total gamma activity (gamma ratio) was determined by gamma scintillation counting and provided trend information only.

3. Plutonium Process Engineering

a. Recovery

Weekly stripping of the solvent extraction column in the Waste Treatment Facility has reduced the plutonium waste loss by a factor of 2. In this column, aqueous wastes from the plutonium reclamation facility are passed through a static solution of DBBP in CCl_4. Plutonium is extracted and held in the solvent; periodically the plutonium is stripped in a solution of nitric and hydrofluoric acids for recycle to the reclamation facility. The column automatically recovers any sporadic losses from the reclamation columns, and limits overall losses to about 100 grams per month.

4. Fission Products Process Engineering

a. Sludge Removal TK-103-A

The effectiveness of the sludge removal test in TK-103-A was evaluated by comparing electrode readings versus measured water additions added to a minimum tank heel. Based on these measurements, it is estimated that up to 30,000 gallons of sludge may remain along the outer circumference of the tank.

b. A Tank Farm

A sudden steam release (commonly called a "bump") occurred in TK-105-A on January 28. Tank 105-A contains the youngest Purex waste and has a 15 gpm boil-off rate. As far as can be determined, air was flowing to all four circulators. This is the first "bump" that has occurred in any Hanford waste tank while the recirculators were believed to be in operation. No abnormal process conditions were noted prior to or following the incident.

5. Separations Chemistry Laboratory

a. Ruthenium Evolution During Thorex Dissolution

Experiments were conducted on synthetic thorex dissolver solution spiked with $RuRh^{106}$ to evaluate the use of hydrazine as a volatility

depressant for ruthenium during thorium dissolution and acid boil-off. With total reflux, ruthenium decontamination factors (conc. in solution/ conc. in condensate) of 1-3 x 10^3 without hydrazine and of much greater than 10^4 with hydrazine were held for periods of four hours. However, during acid distillation the df's dropped to the 100 range for both systems.

b. Analytical Methods

Chemical Assay

Weight burettes were used in conjunction with an automatic titrator to evaluate the combination as a possible improvement over present methods of chemical assay. When iron was titrated with ceric sulfate, a precision of plus or minus .033 per cent was achieved for a single determination with five observations. The equipment is being relocated and revised to permit evaluation of the system for plutonium analysis.

Counting Room Improvements

The MASMAT program, which is the input for the analysis of mixed isotopes (AMI) program, has been changed from Fortran 1 to Fortran II language which is a more flexible and widely applicable language. The last year's accumulation of calibration data can now be incorporated in AMI thus providing additional analytical capabilities on such isotopes as U^{237}, Nd^{147}, Ga^{72}, Na^{24}, Cu^{64}.

Atomic Absorption

The atomic absorption unit was used as an emission unit for the determination of several positive ions in the ppm range. Detection limits determined were Cr <5 ppm, Na $<.005$ ppm, Cs $<.5$ ppm, Ba $<.1$ ppm, Ca $<.05$ ppm, and Sr $<.10$ ppm. The need for a flame with the absorption unit could create an explosion hazard if used in a closed hood. The potential use of a plasma flame or high frequency furnace is being evaluated as an exciter for the sample material. Thus combustible gases would not be a problem, higher temperatures might be attained, and the absorption effect could be measured over a broader group of ions than at present.

6. Plutonium Chemistry Laboratory

a. Recovery of Plutonium from R&B Hood Floor Sludge

A procedure was developed for the safe and controlled dissolution of sludge. Effective dissolving conditions include the use of concentrated nitric acid with Antifoam B* added to one thousand parts per million, and addition of the sludge to the acid while the system was still at room temperature.

* Registered trade-mark, Dow Corning Corporation

A series of small-scale (20 - 50 ml) dissolution runs showed that a sludge-to-solution ratio of 1:10 gave excellent results, a ratio of 1:5 borderline results, and a ratio of 1:2 negative results (tarry product and incomplete dissolution).

Three large-scale dissolution runs were completed. In the first run 100 g of sludge was boiled for two hours under reflux in 15.8M HNO_3, 0.25M HF, 1000 ppm Antifoam B solution. The product was readily filtered through a coarse porosity glass fritted filter under 26" Hg vacuum. The filtrate from this run contained a fine suspension of particles that had passed through the filter. A residue of 2.8 weight per cent resulted from this run.

A 200 g sample of sludge was boiled for three hours under reflux in 15.8M HNO_3-1000 ppm Antifoam B in the second run. The sample was initially filtered under gravity through a coarse porosity filter. After a precoat formed, the remaining solution was then readily filtered under 26" vacuum, giving a clear filtrate. A 12 weight per cent residue resulted from the run.

In the third run a 400 g sample of sludge was dissolved in 2 liters of 15.8M HNO_3-1000 ppm Antifoam B. The results were the same as the second run except the solution required two days to filter.

Samples of sludge were sealed in pressure bombs with 1M NH_2SO_3H, crystalline sodium hydroxide, 5 weight per cent Na_2SO_3, 50 weight per cent NaOH. All of the reagents except crystalline sodium hydroxide resulted in an increase in the rate of pressurization compared to a control sample. No pressurization was observed in the sample with solid caustic after 20 days.

b. Americium Distribution in the Plant Process

Laboratory tests of the flowsheet showed that there was a major difference in behavior of the plant streams compared with the synthetic solutions used in the development studies. This was particularly true in the extraction stage where the americium E_a^c's were a factor of 10-20 below predicted values.

Further testing of the extraction stage indicates the problem lies wholly in the aqueous phase. Samples of plant solution spiked to 1-10 mg/l Am gave americium extraction coefficients of 2.8 - 5.4 in the extraction stage, 1.0 - 3.2 in the scrub stage, and 0.09 - 0.33 in the strip stage. Experiments in which synthetic CAW (feed solution) was contacted with plant organic gave americium E_a^o's of 40 - 60. Runs in which the same plant organic was contacted with plant CAW gave americium E_a^o's of 1 - 4. Substitution of plant organic with fresh laboratory organic made little difference in the americium extraction coefficient.

Analyses of the CAW indicates that the total nitrate is 4.3 - 4.7M NO_3^- which is $\approx$25 per cent lower than the 5.9M NO_3^- used in the synthetic CAW. Based on a third power dependence of the Am E_a^o on nitrate concentration, a 25 per cent decrease in the NO_3^- concentration would cause a 75 per cent decrease in the Am E_a^o.

R. E. Tomlinson
Manager
Research and Engineering

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III. PERSONNEL ACTIVITIES

A. FORCE SUMMARY

Operation	Monthly Salaried 1-3-65	Monthly Salaried 1-31-65	Weekly Salaried 1-3-65	Weekly Salaried 1-31-65	Total 1-3-65	Total 1-31-65
General Manager's Group	9	9	1	1	10	10
Financial	17	18	27	27	44	45
Employee Relations	3	3	3	3	6	6
Research & Engineering	63	60	27	27	90	87
Facilities Engineering	95	95	192	196	287	291
Production	5	5	3	3	8	8
Redox	60	64	222	222	282	286
Purex	68	69	269	272	337	341
Weapons Manufacturing	57	59	262	258	319	317
Total	377	382	1006	1009	1383	1391

B. PERSONNEL CHANGES

J. D. Long was transferred from Business Systems Development Operation, C&AO, to Manager - Business Information Systems, Financial Operation, CPD.

S. J. Beard was transferred from Purex Process Engineering to Manager - Fission Products Process Engineering, Research and Engineering Operation.

C. TRIPS

Visitor	To	Nature of Discussion
To AEC & Other AEC Contractors		
D. L. Clements	Dow Chemical Co. Denver, Colorado	Plutonium shipping methods. (1/7-8/65)
H. P. Shaw	Sandia Corporation, Albuquerque, New Mexico	Symposium on Packaging and Transportation of Radioactive Materials. (1/11-15/65)
L. L. McGregor	American Car & Foundry Albuquerque, New Mexico	Attend 11th IMOG Gage Subgroup meeting. (1/18-20/65)
W. J. Gartin	Dow Chemical Co. Denver, Colorado	Fabrication schedules. (1/25-26/65)
	Albuquerque Operations Albuquerque, New Mexico	Program review. (1/27/65)
To General Industry		
M. T. Slind	Electronic Products Mfg. Co., Spokane, Washington	Fabrication of hand and shoe counters. (1/28-29/65)
To Professional Society Meetings		
E. M. Johnston	Vancouver, B.C., Seattle, Washington	Address meetings of ASME as President: Univ. of B.C. (1/25/65); Seattle Univ. (1/26/65); Univ. of Wash. (1/27/65); Attended Washington Section of ASME on 1/26/65

D. VISITORS

Visitor	From	Nature of Discussion
From Other GE Components		
W. Lyon	Vallecitos Atomic Lab. Pleasanton, Calif.	Technological and analytical methods for mixed fuels. (1/25-26/65)

D. VISITORS (Continued)

Visitor	From	Nature of Discussion
From AEC & Other AEC Contractors		
J. A. Erlewine	Atomic Energy Commission Washington, D. C.	Tour Purex. (1/7/65)
M. E. Harris A. Williams	Lawrence Radiation Lab. Livermore, Calif.	Special plutonium fabrication. (1/8/65)
G. Powers	Dow Chemical Co. Rocky Flats Plant Denver, Colorado	Discuss cutting tools and metal cutting process. (1/15/65)
L. H. Meyer H. J. Groh	E. I. du Pont Savannah River Lab. Aiken, S. Carolina	233 U processing and Anion Exchange resin hazards. (1/11-12/65)
L. Poe C. J. Fitzgerald B. J. Fowler	E. I. du Pont Savannah River Lab. Aiken, S. Carolina	Discuss plutonium processing. (1/25-26/65)
From General Industry		
Tom D'Muhala William Crescenti Leonard Robinson	General Dynamics Groton, Conn.	Decontamination procedures. (1/6/65)
From Other Federal & State Agencies		
J. N. Wilson	C. I. A Washington, D.C.	Purex process orientation. (1/18/65)
From Foreign Governments & Agencies		
K. R. Kummerer	Euratom Karlsruhe, Germany	Witness sampling and packaging of Euratom PuO_2 order. (1/12-14/65)
Georges Roussel	French CEA Critical Mass Lab. Is Sur Tille, Cote D'Or	Sampling analyses and inventory control. (1/13/65)

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IV. SAFETY AND SECURITY

Operation	General	Purex	WMO	FEO	Redox	R&E	Finance	Prod.	Empl. Rel.	Total	YTD
Dis. Injuries										0	0
Ser. Accidents					*1					1	1
Med. Treat. Inj.		8	11	10	11	1				41	41
Rad. Occurrences		6	3		4					13	13
Contam. Wds.		3	1		2					6	6
New Deposition Cases										0	0
Fires										0	0
Security Violations		1		1	1					3	3

*Serious Accident 65-1, January 4. Electrical fault occurred in 2.4 KV feeder line outside the 202-S Switchgear Room. Resultant short, probably caused by moisture, deteriorated installation and localized explosion and fire resulted. There were no injuries to personnel. Bus bars were replaced by insulated cables at a cost of $1,600.

[redacted]

K-1

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V. REPORTS

A. PREPARED AND ISSUED

HW-80971,OUO, Project Proposal, "B" Plant - Semiworks Transfer System - 200 East Area (Project CAC-162)", by L. W. Finch, dated January 7, 1965.

HW-82294 L16, Secret, "Button Purity Data - Letter No. 16", by R. J. Sloat, dated January 5, 1965

HW-82778, OUO, "Preliminary Project Proposal, Sludge Removal and Waste Transfer - 200 East Area (Project CAC-169)", by C. A. Lyneis, dated January 22, 1965.

RL-SEP-66 Supl, Unclassified,"Hazards Review - Thorium-Uranium-233 Processing in Purex", by L. W. Finch, dated January 6, 1965

RL-SEP-85 REV, Unclassified, "Critical Mass Control Specification - Processing of Plutonium in Corridor 9, 234-5 Building", by R. J. Sloat, dated January 8, 1965

RL-SEP-115, Unclassified, "Process Specifications for In-Tank Solidification of Radiochemical Wastes", by J. J. Shefcik, dated December 3, 1964

RL-SEP-121, Unclassified, "Uranium Oxide Operation Feed Specification - Redox Enriched UNH Product", by R. J. Sloat, dated January 27, 1965

RL-SEP-141, Unclassified,"Design Criteria - Project CAC-124 Increased Processing Flexibility - Purex, Part I, Rev. No.2", by J. R. LaRiviere, dated December 10, 1964

RL-SEP-195, Secret AWD, "Evaluation of Air-Actuated Electrojet (FPT 64-29)", by L. L. McGregor, dated January 4, 1965

RL-SEP-198, Secret AWD, "Averaging Procedure and Evaluation Method for Tsetse Components", by J. M. Pinkerton, dated January 5, 1965

RL-SEP-201, Secret, "Redox Thorium Process Flowsheet", by O. D. Erlandson and W. L. Godfrey, dated January 12, 1965

RL-SEP-204, Secret AWD, "Quarterly Summary Reports", by A. E. Smith, dated January 6, 1965

RL-SEP-208, Secret, "Analyses of Neptunium Batches - Purex No. 24 and 25", by M. K. Harmon, dated January 4, 1965

A. PREPARED AND ISSUED (Continued)

RL-SEP-232 L17, Secret, "Button Purity Data - Letter No. 17", by R. J. Sloat, dated January 8, 1965

RL-SEP-232 L18, Secret, "Button Purity Data - Letter No. 18", by R. J. Sloat, dated January 22, 1965

RL-SEP-233, Confidential, "Annual Nuclear Safety Review, Chemical Processing Department", by L. M. Meeker, dated December 1, 1964

RL-SEP-236, Secret AWD, "Corrosion Test Data 1964 Parts", by A. E. Smith, dated January 7, 1965

RL-SEP-237, Secret AWD, "Tantalum Shape Casting Melt Crucibles Interim Summary of Fabrication Process Test FPT 64-26", by C. M. Walker, dated January 7, 1965

RL-SEP-241, Unclassified, "Redox Solvent Treatment - In-Line Blender Study", by C. E. Jenkins, dated January 12, 1965

RL-SEP-245, Secret AWD, "Waiver of Intermediate Product Density Specifications", by A. E. Smith, dated January 14, 1965

RL-SEP-247, Secret AWD, "A Line Product Characteristics - December 1964", by A. E. Smith, dated January 14, 1965

RL-SEP-248 RD, Secret, "Uranium Oxide Report - January 1, 1965", by R. Y. Lyon, dated December 31, 1964.

RL-SEP-249 RD, Secret, "Z Plant Report - Task I-II and Recovery Operations - January 1, 1964 through December 31, 1964", by R. L. Walser and R. Y. Lyon, dated January 1, 1965

RL-SEP-254, Unclassified, "Preliminary Evaluation of Process Test BL-64-1 - Use of Manganous Nitrate as Catalyst for Heat Kill of Oxalate Filtrates", by R. L. Walser, dated January 20, 1965

RL-SEP-256, Secret AWD, "A Line Quarterly Summary Report Quarter, Calendar Year 1964", by A. E. Smith, dated January 19, 1965

RL-SEP-258, Secret, "Analyses of Neptunium Batches - Purex No. 25 and 26", by M. K. Harmon, dated January 18, 1965

RL-SEP-259, Secret, "Status of Reusable Reduction Liner Development", by R. S. Rosenfels, dated January 20, 1965

RL-SEP-260, Secret, "CPD Waste Status Summary, July 1, 1964 through December 31, 1964", by R. E. Roberts, dated January 19, 1965

A. PREPARED AND ISSUED (Continued)

RL-SEP-261, Secret AWD, "Determination of the 88-C Neutron Counting Factor", by C. S. Homi and G. C. Oberg, dated January 18, 1965

RL-SEP-262, Confidential, "Impurity Analyses on 1807 Parts", by A. E. Smith, dated January 21, 1965

RL-SEP-264, Secret AWD, "Intermediate Product Characteristics", by A. E. Smith, dated January 22, 1965

RL-SEP-265, Confidential AWD, "Gaging Approval", by A. E. Smith, dated January 22, 1965

RL-SEP-266, Confidential AWD, "Letter - Determination of Neutron Counting Factor for 88-C Components", by A. E. Smith, dated January 22, 1965

RL-SEP-268, Unclassified, "Hazards Evaluation - 241-AX Tank Farm (Project CAC-945) and Essential Waste Routing System (Project CAC-970)", by M. D. Alford, J. A. Forest, W. A. Haney, M. L. Oldfather and J. J. Shefcik, dated January 22, 1965

RL-SEP-270, Unclassified, "Critical Mass Control Specification - Process Test BL-65-1", by R. J. Sloat, dated January 25, 1965

RL-SEP-271, Secret, "Preliminary Study of Normal, E, and NPR (to 2% U^{235}) Uranium Campaign Processing at the UO_3 Plant", by R. Y. Lyon, dated January 28, 1965

RL-SEP-277, Secret, "Plutonium to Uranium Determinations", by G. L. Hanson, dated January 28, 1965

RL-SEP-291 RD, Secret, "Purex, Redox, UO_3 Production Schedules - February, 1965", by D. McDonald, dated February 2, 1965

RL-SEP-292 RD, Secret, "234-5 Building Production Schedule - February 1965", by D. Mcdonald, dated February 2, 1965

RL-SA-9, Unclassified, "Counter-Current Crystallization", by W. L. Godfrey, dated December, 1964

B. PREPARED FOR SIGNATURE AND ISSUANCE

RL-GEN-8, Secret, "Production - December, 1964", by W. E. Johnson, dated January 19, 1965

CHEMICAL PROCESSING DEPARTMENT
MONTHLY REPORT

JANUARY, 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
Robert G. Oliver	Portable Critical Incident Alarm

J. H. Warren
General Manager
Chemical Processing Department

DATE
FILMED
01/21/93