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HW-53967-DEL

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CHEMICAL PROCESSING DEPARTMENT  
MONTHLY REPORT  
FOR  
NOVEMBER, 1957

HW--53967-Del.

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Compiled By  
OPERATION MANAGERS

December 23, 1957

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By Authority of *J.P. [unclear] 5/28/95*  
By *[unclear] 6/9/92*  
*J.W. Wells 6-9-92*

HANFORD ATOMIC PRODUCTS OPERATION & AEC DIVISION OF CHEMISTRY  
RICHLAND, WASHINGTON

Received

Work performed under Contract No. W-31-109-Eng-52 between  
the Atomic Energy Commission and General Electric Company

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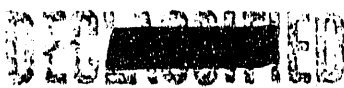


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CHEMICAL PROCESSING DEPARTMENT  
MONTHLY REPORT

NOVEMBER, 1957

GENERAL SUMMARY

PRODUCTION

Plutonium production in the separations plants slightly exceeded the November commitment. With dissolver off-gas treatment facilities in operation in both separations plants, irradiated uranium aged as little as 90 days from reactor discharge was processed. Redox plant was shut down for 11 days early in the month to permit the replacement of failed equipment. On November 26, 1957 Purex plant began a scheduled shutdown for equipment modifications.

The production of  $UO_3$  was 93% of the monthly commitment; however, on a cumulative basis  $UO_3$  is 8% ahead of the quarterly commitment. At the end of the shipping period on November 20,  $UO_3$  shipments were 24 tons ahead of the shipping schedule.

Unfabricated plutonium production was 105% of the monthly commitment, and shape production was 96% of the commitment. The production of low N/g shapes was 37% of the commitment due to a lack of feed caused by the generation of normal scrap in the fabrication process. High N/g shape production was 105% of the monthly commitment.

ENGINEERING

An engineering study is underway to determine specific limitations to Purex capacity beyond a capacity factor of 3.2 under two-cycle flowsheet conditions. The purpose of this work is to gain familiarity with process equipment limitations and characteristics in order that the effects of varying flowsheet criteria and production requirements can be held in continual review.

A proposed method and procedure for the repair and upgrading the integrity of the Purex block bails has been accepted as a basic concept. Details of work determination, formal estimates of cost, and final design are in process. Justification for the project will be based on failure of two (2) bails in operation, and the inherent weakness of the original design.

Directive AEC-64, Modification 5, dated November 8, 1957; and Work Authority CA-513-E(5), dated November 15, 1957, authorized the full scope of work, including capacity increase from capacity factor 2.75 to 3.2 under Project CA-513-E, Expansion of 200 Area Facilities. Total funds in the amount of \$2,660,000 were authorized.

Final design of E Metal dissolver vessels is proceeding in accordance with the definitive process design.

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Project Proposal, Revision 1 to CG-745 - RMC Fabrication Line requesting total project funds, was transmitted to HOO-AEC on May 17. A directive authorizing \$60,000 additional design funds was received by the General Electric Company on November 8, 1957. A directive authorizing total project funds of \$1,000,000 was received by the General Electric Company on November 25.

Preliminary investigative engineering work has continued in anticipation of assignment of reprocessing of low enrichment power reactor fuels to Chemical Processing Department. Significant developments in the field of power fuels reprocessing during the past month include:

- a. Hanford Laboratories has initiated a study considering various combinations of known processes and installations aimed at ultimately obtaining the most economical facilities in meeting the interim processing requirements.
- b. Recent reports from designers and prospective operators of new reactors now being considered indicate that the low enrichment range may be extended above 3 percent U235.
- c. A review of the criteria for examination of Plutonium Recycle Test Reactor fuel elements after irradiation indicates requirements beyond any mechanical facility conceived currently for the power fuels reprocessing.

A 14 curie iodine emission was experienced when the canyon crane in Redox plant was cleaned by spraying with a chlorinated hydrocarbon solvent. The chlorine from the solvent apparently displaced radio-iodine from the sand filter and permitted its escape. Exclusive of this incident, iodine emissions averaged 0.1 curie per day while processing 87 to 115 day-cooled fuels.

Preliminary testing indicates that the use of Glascast, a proprietary borosilicate glass powder produced by the Corning Glass Works, is promising for making precision molds for plutonium castings. Plutonium specimens cast in these molds were unusually fine-grained, and had nearly twice the tensile strength of metal cast in graphite. A boron concentration of 4 ppm was found in the outer shell of metal.

#### GENERAL

Preparation of the FY 1958 Midyear Budget Review was completed and required schedules were submitted on due date. Additional schedules were also submitted for analysis purposes. Estimates for production cost were \$1,335,000 under the FY 1958 Revised Budget. Quarterly costs presented in the Review are currently being broken down functionally by months for issuance on either the December or January operating reports.

Research and Development budgeted costs were up \$200,000 from the FY 1958 Revised Budget, reflecting the addition of the SS Materials management program and readjustment of overheads to agree with current rates.

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The anticipated cost of G.E.'s Insurance Plan for 1957 has been less than expected and a corresponding reduction in the accrual rate for insurance costs has been designated. Benefit Plans makes payment each month, towards insurance cost, in an amount equal to total employee contributions plus accrual rate of 1.8% of that part of payroll gross identifiable as compensation, under the terms of the Pension Plan. Because of the reduced cost, the accrual rate has been reduced to 1.2% retroactive to October 1, 1957.

The procedural study for changing the Store Orders detail by Cost Code Report was completed during November. The changes have been programmed and will be reflected in the January reports. These changes will result in an annual clerical savings of 1,040 hours and annual supplies of \$520.

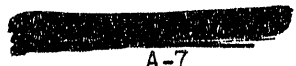
The Report to Employees on the Attitude Survey was distributed to all employees during November.

The questioning of Company intent by HAMTC regarding annual exposure limits at "Z" plant has been answered satisfactorily. A refinement in the method of measuring dosage had been misunderstood by the Council.

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STAFF

Vice President and General Manager, Atomic Products Division . . F. K. McCune  
General Manager, Hanford Atomic Products Operation . . . . . W. E. Johnson  
General Manager, Chemical Processing Department . . . . . W. K. MacCready  
Manager, Production Operation . . . . . J. H. Warren  
Manager, Purex Operation . . . . . O. C. Schroeder  
Manager, Redox Operation . . . . . C. T. Groswith  
Manager, Finished Products Operation . . . . . W. N. Mobley  
Manager, Power & General Maintenance Operation . . . . . T. G. LaFollette  
Manager, Financial Operation . . . . . K. G. Grimm  
Manager, Facilities Engineering Operation . . . . . H. P. Shaw  
Manager, Research and Engineering Operation . . . . . V. R. Cooper  
Manager, Employee Relations Operation . . . . . D. S. Roberts



CHEMICAL PROCESSING DEPARTMENT  
NUMBER OF EMPLOYEES  
NOVEMBER 30, 1957

OPERATION	EXEMPT		OTHER		TOTAL	
	10-31-57	11-30-57	10-31-57	11-30-57	10-31-57	11-30-57
GENERAL MANAGER'S GROUP	10	10	1	1	11	11
PRODUCTION	7	7	3	3	10	10
PUREX	43	43	242	241	285	284
REDOX	54	54	291	289	345	343
FINISHED PRODUCTS	52	53	303	299	355	352
POWER AND GENERAL MAINTENANCE	46	43	243	237	289	280
FINANCIAL	22	21	48	46	70	67
FACILITIES ENGINEERING	79	78	25	21	104	99
RESEARCH AND ENGINEERING	62	62	24	24	86	86
EMPLOYEE RELATIONS	31	31	55	53	86	84
	406	402	1235	1214	1641	1616

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CHEMICAL PROCESSING DEPARTMENT

PATENT SUMMARY  
FOR  
MONTH OF NOVEMBER, 1957

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.

<u>INVENTOR</u>	<u>TITLE</u>
Clair F. Setbacken	Determination of the plutonium (Pu) concentrations in solutions, slurries and dry solids accurate enough to be used as an aid in Pu process control by means of a neutron counter. (Application submitted 10-3-57)

*J. N. Warren*  
ACTING GENERAL MANAGER  
CHEMICAL PROCESSING DEPARTMENT

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CHEMICAL PROCESSING DEPARTMENT  
PRODUCTION OPERATION

NOVEMBER, 1957

I. RESPONSIBILITY

There were no changes in the responsibility assigned to the Production Operation during the month.

II. ACHIEVEMENT

A. Production Statistics

Plutonium production in the separations plants exceeded the November commitment. Dissolver off-gas treatment facilities are in operation in both separations plants, which permitted the processing of irradiated uranium aged as little as 90 days from reactor discharge. Purex Plant began a scheduled shutdown on November 26, 1957 to permit the installation of a modified extraction column in the co-decontamination cycle and prototype ion exchange equipment in the final plutonium cycle.

Production of  $UO_3$  was 93% of the monthly commitment; however, on a cumulative basis  $UO_3$  production is 8% ahead of the quarterly commitment. Shipments of  $UO_3$  were approximately 24 tons ahead of the shipping schedule at the end of the shipping period on November 20, 1957.

Production of unfabricated plutonium metal was 105% of the monthly commitment, and overall shape production was 96% of the commitment. The lack of available low N/gs plutonium, which was caused by the generation of normal scrap in the fabrication process, resulted in low N/gs shape production being 37% of the commitment. Production of high N/gs shapes was 105% of the monthly commitment.

1. Purex Operation

	<u>November</u>	<u>October</u>
Tons uranium delivered to storage	425.0	477.17
Average production rate per operating day (tons)	16.5	16.45
Average yield, %		
Uranium	94.6	96.95
Plutonium	98.9	95.43
Total waste loss, %		
Uranium	0.15	0.20
Plutonium	0.51	0.54
Average cooling time (days)	103	107
Minimum cooling time (days)	89	97
Percent operating time	85.7	93.6

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2. Redox Operation

	<u>November</u>	<u>October</u>
Tons uranium delivered to storage	163.1	181.6
Average production rate per operating day (tons)	8.6	7.9
Average yield, %		
Uranium	99.4	99.9
Plutonium	92.8	89.6
Total waste loss, %		
Uranium	0.17	0.24
Plutonium	0.78	0.85
Average cooling time (days)	103	110
Minimum cooling time (days)	87	96
Percent operating time	63.0	74.3

3. 234-5 Operation

	<u>November</u>	<u>October</u>
Batches completed through Task I	375	393
Batches completed through Task II	210	391
Runs completed through Task III	221	199
Reduction yield, %	97.00	98.00
Waste disposal (units)	721.18	859.22

4. UO<sub>3</sub> Operation

	<u>November</u>	<u>October</u>	<u>To Date</u>
Uranium accepted (tons)	610.96	703.8	23,818.36
Uranium shipped (tons)	607.54	649.3	23,607.14
Average cooling time (days)	109	116	
Minimum cooling time (days)	93	102	

5. Power

	<u>200 East</u>	<u>200 West</u>
Raw water pumped, gpm	7,944	3,933
Filtered water pumped, gpm	1,033	748
Maximum steam generated, lbs/hr.	230,000	142,000
Average steam generated, lbs/hr.	177,099	108,223
Total steam generated, M lbs.	127,511	77,921
Coal consumed, ext. (tons)	7,778	5,278

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6. Waste Storage

	Equivalent Tons U	
	Nov.	Oct.
Salt waste reserve storage capacity-Redox	7,744	7,837
Salt waste reserve storage capacity-Purex	7,408	7,473
Coating waste reserve storage capacity-Redox	15,666	15,829
Coating waste reserve storage capacity-Purex	18,800	19,232

B. Production Planning and Scheduling Operation

Scavenging continued during the month with feed supplied from B Farm, the last three tanks of material scheduled for processing. Reclaimed storage since scavenging was resumed in March, 1957, has now reached 6,863,550 gallons of which 684,000 gallons was recovered in November. October production was 105% of scheduled.

The significant contribution of the scavenging program is reflected in the following table:

	Stored Waste Inventory					
	6-1-57	7-1-57	8-1-57	9-1-57	10-1-57	11-1-57
Gallons X 10 <sup>3</sup>	56,415	55,987	54,989	54,238	53,311	52,027
% of Design (90,107,000 gals.)	62.6	62.1	61.0	60.2	59.2	57.7

During October the boil-off of Purex salt waste in Tanks 101-A and 103-A continued at a fast rate, resulting in a net decrease in storage of 88,000 gallons. Liquid level was maintained above the bottom circulators by adding 28,000 gallons of water to Tank 101-A and 184,000 gallons to Tank 103-A. Total water additions since last February have been 1,843,000 gallons. Self-concentration in Tank 101-A increased to 362,000 gallons which discounted 132% of the waste received during October. Total self-concentration in A Farm since inception during July, 1956, amounts to 3,374,000 gallons (76.1% of total Purex waste currently stored in A Farm) as compared to 4,341,000 gallons (34.5%) reclaimed at SX Farm where self-concentration started in November, 1954. Water additions amounting to 13,000 gallons (total to date - 339,000 gallons) were also made to SX tanks.

Although Purex continues to generate more coating waste per unit processed than Redox, improvement was shown for the sixth consecutive month. Currently, the figure is 78%. Using six month cumulative averages to give a more realistic comparison, actual performance is tabulated below:

	May	June	July	August	September	October
Redox	148	154	148	154	148	152
Purex	311	310	304	297	285	271

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B. Production Planning and Scheduling Operation (Continued)

In July, 1957, a statistical study of the static waste storage tanks showed that the average precision for a single measurement was  $\pm 18,589$  gallons (95% confidence level). Duplication of the study in November, covering the previous four months, revealed an average precision for a single measurement of  $\pm 2,993$  gallons (95% confidence level). The significant improvement in measuring technique gives greater assurance to leak detection.

C. Finished Products and Customer Liaison

During the month the third proposal for performing a fission products market survey was received, and the three proposals were evaluated to determine which provided the best balanced analysis. A proposal, including selection of a marketing research agency, selected on the basis as the one judged as having the best balance of technical knowledge and marketing research experience necessary for a survey of this nature, was thus sent to HOO-AEC for authorization to proceed with the survey.

The direct cost of the proposed survey is estimated to approximate \$100,000. Alternate surveys were evaluated and found to cost approximately \$75,000 by appreciably reducing the scope and depth of analysis of the survey. A survey reduced in scope would be feasible; however, the proposed intensive study is recommended to realize the value of a technically and economically balanced analysis.

The survey as proposed will require approximately ten months after authorization to complete.

D. Essential Materials

During November, the most economical method of transporting hexone was via tank truck. The 50,720 pounds received represents a savings of \$251. Accumulated savings since inception of tank truck deliveries is \$959. December deliveries will be via rail transportation.

A ferrous carbonate sample was obtained for testing to establish the feasibility of manufacturing ferrous sulfamate at Purex Plant from sulfamic acid and ferrous carbonate.

The savings accumulated during the first eleven months of 1957 resulting from the plan of receiving caustic soda by the most economical transportation are estimated at \$10,455. During November the least expensive mode of transportation was by rail tank car.

E. Reports and Documents

1. Prepared and Issued

- HW-53441 UC<sub>3</sub> Plant Production Schedule, November, 1957  
B. F. Campbell
- HW-53442 234-5 Plant Production Schedule, November, 1957  
B. F. Campbell
- HW-53443 Redox Plant Production Schedule, November, 1957  
B. F. Campbell
- HW-53444 Purex Plant Production Schedule, November, 1957  
B. F. Campbell
- HW-53503 Essential Material Consumption - Purex - Chemical Processing Department, for October, 1957  
M. A. Thress
- HW-53555 Essential Material Area Report to Cost and Purchasing, Production Operation, Chemical Processing Department, for October, 1957  
M. A. Thress
- HW-53573 Chemical Processing Department - Waste Status Summary for October, 1957, R. E. Roberts
- HW-53507 Purex Plant Shutdown, V. R. Chapman
- CLVI-136 Measurement Goal Forecast, V. R. Chapman

2. Prepared for Signature and Issuance

- HW-53448 Production Report - October, 1957, W. K. MacCready
- HW-53458 Comments on Albuquerque Schedule CXXX-1357, J. H. Warren

III. ORGANIZATION AND PERSONNEL

A. Force Summary

	<u>Beginning of Month</u>	<u>End of Month</u>
Exempt	7	7
Non-Exempt	<u>3</u>	<u>3</u>
Total	10	10

B. Safety

There were no plant injuries incurred by Production Operation personnel during November, 1957.

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C. Security

There was one security violation in the Production Operation during the month involving improper handling of a classified document. Handling procedures have been revised to provide better control of documents.

D. Visits

During the week of November 4, Messrs. D. W. Cardwell, D. M. Shepard, W. S. Hornbaker and E. A. Frunco-Ferreira, Union Carbide, Oak Ridge, Tennessee, visited the Chemical Processing Department for the purpose of discussing remote maintenance of hot facilities.

*V R Chapman*  
Acting Manager  
Production Operation

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CHEMICAL PROCESSING DEPARTMENT  
PUREX OPERATION

November, 1957

I. RESPONSIBILITY

The Purex Operation was assigned radiation monitoring responsibility for all construction work at Purex, beginning November 15, 1957. Monitoring for construction work prior to this date was performed by the Hanford Laboratories Operation. Active construction requiring monitoring at this time includes the prototype plutonium ion-exchange unit, the second remote crane installation, and the new waste underground storage crib facilities.

II. ACHIEVEMENT

A. Processing Experience

1. Normal Processing

Processing was continuous throughout the month until 4 p.m., November 26, at which time a scheduled shutdown was begun to accomplish canyon equipment changes and tie-ins. Extraction processing rates during the period varied from 1.44 CF to 2.40 CF. The monthly production commitment was exceeded by 6.25 percent, while operating at 85.7 percent of the total hours in the month.

Product waste losses were 0.15 percent and 0.51 percent for uranium and plutonium, respectively; both numbers representing record lows for the Purex operation to date.

Ten batches of out-of-specification uranium were produced. Seven of these were a carryover from the previous month when difficulty was encountered with plutonium contamination in the uranium. The remaining three batches were a result of a fission product activity breakthrough in the final uranium cycle 2D column caused by interface instrument difficulty. All plutonium product met specifications. Improved uniformity of acid strength and the close control of dissolver acid volumes permitted by the recently installed magnetic flow meters resulted in shorter dissolution cycles and in more uniform feed throughout the month.

On November 1, the diaphragm-operated valve in the #1 waste concentrator feed jumper failed. In order to prevent a building shutdown, the dilute waste was bypassed around the concentrator, neutralized, and sent to underground waste storage while a spare jumper was being modified and installed. Operation of the concentrator was resumed sixteen hours after the feed jumper failure.

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## 2. Special Processing

Approximately 575 units of plutonium were recovered by recycling concentrated waste from the #1 waste concentrator (IWW Stream) and blending with virgin feed. This rework material had been isolated in the waste rework tank, F8, from the processing of two batches of acid-deficient feed late in October. With the exception of a temporary two- to three-fold increase of gamma activity in the intercycle streams no processing difficulties were encountered.

The rework of approximately 129 tons of out-of-specification uranium produced in October was successfully accomplished by processing it through the final uranium cycle at high rates while continuing to process new material through the plant. No adverse effects were noted.

Attempts to reclaim approximately 600 pounds of uranium from #1 organic (isolated and stored during October) resulted in high plutonium losses in the precycle columns and rework was temporarily discontinued. Four thousand gallons of the material were acidified, butted with sodium nitrite and sent to the waste rework tank, F8, for blending with virgin feed. To date approximately 1,000 gallons have been reworked.

During the scheduled shutdown the precycle HA column was given a thorough flush in preparation for replacement with an improved column. The #2 organic system was flushed to improve the column operation, and the #2 waste concentrator and the L Cell package were given a routine flush.

## B. Radiation Experience

Seven cases of skin contamination were incurred during the month. The maximum levels of contamination involved were 70,000 c/m (4.8 rads/day by autoradiography) and 2,000 d/m. Decontamination was prompt and effective.

Radio-iodine emissions from the Purex stack amounted to 19.91 curies during November for an average daily emission of 0.64 curies. The Purex weekly limit of 6 curies was exceeded for the week ending November 14, when a total of 7.15 curies were emitted; however the total CPD emission for the same period did not exceed the limit of 10 curies. Addition of mercuric nitrate to the plant feed stream was effective in suppressing iodine evolution from the vessel vent system. Regeneration of the vessel vent silver reactor is scheduled for the current plant outage.

A burial box, containing failed process jumpers and measuring 450 mrad/hour at 150 feet, was buried on November 15, with a maximum exposure to personnel of 400 mrad/hour. While in transit to the burial garden, liquid dripped from the box, resulting in spotty contamination of 40 to 1700 mrad/hour to the railroad roadbed. Railroad crossings were promptly decontaminated and resurfaced. Decontamination of the road bed is

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scheduled for the coming month. Contamination spread to the canyon deck, tunnel, and tunnel cut, deposited during the burial operation, has been removed.

Replacement of failed piping on the de-entrainment vessel (underground waste tank condenser system) was performed with shielding at a maximum personnel dose rate of 1500 mrad/hr. In order to accomplish this work it was necessary to vent the boiling underground waste tanks to the atmosphere via the inactive 241-A-106 tank. Although a fiberglass filter placed over the vent opening of 106 tank became contaminated to 950 mrad/hr., contamination to the environs was negligible.

C. Mechanical Experience

1. Diaphragm-Operated Valve Failure

The cause of the failure of the #1 waste concentrator feed jumper on November 1 was traced to an air leak in the vicinity of the valve diaphragm. A spare jumper was installed. Since operational control of the concentrator no longer requires a rotameter, this equipment was removed from the assembly prior to jumper installation.

2. Remote Crane

Dissolver charging schedules were temporarily interrupted when the north and south bridge travel of the remote crane failed on November 15. A seventeen hour crane outage resulted. The crane was returned to service after replacement of burned interlock relay contacts in the trolley circuitry.

3. Radiation Zone Door Control

Loss of electrical power in the dispatchers control panel was experienced on November 25, preventing remote operation of door locks and switches to radiation control zones for approximately three hours. Repairs were made by replacement of a burned out transformer and a defective rectifier; the latter believed to be the contributing cause of failure.

D. Analytical Control Experience

During the past month no process difficulties arose requiring special analytical services. Routine analyses were performed. Investigations were undertaken to improve the correlation of nitric acid values determined by titration with the values obtained from the specific gravity tables. A similar comparison of uranium values for the final product sample (K-6) as determined by calculation from the specific gravity and by X-ray photometer assay was made. No appreciable bias or difficulty was found on the uranium values by either method on this sample.

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E. Improvement Experience

1. Process Tests and Revisions

(For more detailed information on these and other items see the Research and Engineering portion of the Chemical Processing Department report.)

To improve the performance of the final plutonium cycle 2A column and the partition cycle 1B column at higher rates, the plutonium extractant stream to the 1B column was decreased. This change permitted operation of the final plutonium columns at higher concentration with improved column stability, and without sacrifice to product quality or waste losses.

In an attempt to increase the absorption efficiency and nitric acid strength of the 293-A off-gas treatment facility, revisions were made to the absorber recirculation system permitting acid to be returned to the eighth plate rather than the third plate as originally designed. A three percent increase in acid strength (to 20 percent) is expected from this change. Off-gas sample taps were also installed upstream and downstream of the acid absorber and caustic scrubber to measure efficiencies of these units. Test procedures have been established to determine the benefits of these alterations during the next operating period.

2. Inventions and Discoveries

No inventions or discoveries were reported by Purex Operation personnel during November.

F. Events Influencing Costs

Careful scheduling of Purex production and the absence of operation difficulties permitted an outage at the end of the month to accomplish equipment repair and replacement, and to permit the maximum number of personnel to observe the double Thanksgiving holiday. Approximately \$4,000 in direct labor costs were saved by a plant shutdown over the holidays.

G. Plant Development and Expansion

During the outage, tie-in of the prototype plutonium ion-exchange unit to the L Cell plutonium system was made to permit initial operation of the ion-exchange unit during the forthcoming operating period.

At the end of the month, the jumpers were stripped from the precycle HA column in preparation for replacement of this unit with a column of improved design and operating characteristics. Performance of the new column is a key to future operation of a two-cycle process.

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H. Reports Issued

1. Non-Routine

HW-53455 (Unclassified) "Fluorimeter Uranium Analysis with a High Carbonate Flux", November 1, 1957, by M. H. Campbell.

III. ORGANIZATION AND PERSONNEL

A. Safety

There were no disabling injuries or serious accidents at Purex during November. A total of 11 medical treatment cases were reported.

B. Security

There were no security violations during the month.



MANAGER  
PUREX OPERATION

OC Schroeder:JCG:gt

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HW-53967 DEL

CHEMICAL PROCESSING DEPARTMENT  
REDOX OPERATION

NOVEMBER, 1957

I. RESPONSIBILITY

On November 18, 1957 monitoring responsibility for the Redox Operation construction work was transferred from the Hanford Laboratories Operation to the Redox Radiation Monitoring Operation. With this change, two additional radiation monitors were added to the rolls.

II. ACHIEVEMENT

A. Processing Operation

1. Production Rates and Operating Continuity

On 11-1-57 the Redox Facility was shut down for replacement of the leaking H-4 oxidizing tank. Installation difficulties with the H-4 tank and gross contamination of the canyon and crane, as a result of the H-Cell maintenance work, required that the facility remain down until 11-12-57. Operations were resumed at 1000 on 11-12-57 and were continuous for the balance of the month.

The operating efficiency for the month was 63% and the mechanical efficiency was 74.6%. The solvent extraction system was operated at rates ranging from 76 to 120% of Phase II, except for a 96 hour period at 60% due to operational difficulties encountered at Z Plant. As a result of the H-4 tank replacement and the reduced operating rate only 81.6% of the month's production commitment was achieved.

The uranium stream was consistently above specification on gamma ratio this month. Only four percent of the 3EU batches met the specification for fission product activity, and approximately 80% of the throughput required treatment in both the ozonation and silica gel facilities before meeting shipping specifications. Inadequate feed clarification continues to be the cause of the poor uranium decontamination despite an increase in frequency of H-2 cake removal to an average of once every sixth batch. Washing of the centrifuge cake, without the benefit of a skimmer or tachometer, resulted in recycling approximately 85% of the cake activity, thus rendering the centrifuge virtually ineffective. Replacement of the centrifuge, which was postponed due to other pressing process problems, will be necessary in the near future.

Plutonium production remained within shipping specifications throughout the month. Waste losses were slightly higher than

normal and amounted to 0.76% of the total plutonium produced and 0.17% of the total uranium produced. One major source of the losses appeared to be the gassing of the E-2 receiver tank jet following solution transfer to the E-3 sample tank. After the elimination of gassing on this transfer the salt waste losses were reduced to less than 0.4%. The cause of the remaining discrepancy between extraction and total waste losses has not been ascertained.

During the extended downtime at the beginning of the month the waste cell solutions, which contained significant rework quantities of plutonium, were collected, concentrated and processed through the precycle battery. The resulting material was collected in the D-7 rework tank for subsequent processing through the head-end. A 60% nitric acid flush was also made of the F-7 and F-8 feed tanks to recover suspected plutonium polymer from a previous rework operation. Both of these steps were accomplished with satisfactory results and operation since startup appears to be giving better waste loss performance through the extraction cycle.

Flushing of the 1A, 1S, and 2D columns with 10% nitric acid recovered only a small amount of plutonium, indicating that the extractant flows, at a 400 flow ratio, were sufficient to prevent plutonium deposition.

To prevent plugging of the system during the extended shutdown, a 10% nitric acid flush of the D-14 concentrator cooler and back-cycle header was made. No difficulties were experienced during startup.

The dissolvers were in operation 80% of the month processing metal with cooling periods of 87 to 115 days. An Iodine-131 emission to the stack of 14.1 curies occurred on 11-23-57, concurrent with extensive solvent spraying of the canyon crane. This apparently resulted from the passage of the chlorinated hydrocarbon vapors through the sand filter and its associated ventilation system. Exclusive of this peak, Iodine-131 emission to the stack averaged 0.10 curie per day of dissolver operation. The apparent combined efficiency of the silver reactors and caustic scrubber was 99.95%.

The Redox Acid Recovery and Iodine Removal Facility has been in continuous operation since 11-15-57, producing nitric acid at approximately 54%. Despite unsatisfactory balancing of the oxygen and specific gravity controllers, the acid recovery has averaged about 80% of that theoretically available.

Two equipment burials were conducted during the month. On 11-1-57 an H-4 oxidizing tower, which had been in dead storage for approximately two years, was removed from J-Cell and transferred to the burial garden. Burial operations were completed without incident.

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On 11-6-57, a liner box loaded with inoperable and highly contaminated H-Cell equipment was moved to the burial gardens for disposal. During the normal procedure of collapsing the lid of the burial box a ruthenium contamination spread occurred. Details of the incident have been covered in a separate report.

Although every reasonable precaution was taken to minimize the spread of contamination during the H-Cell equipment removal and maintenance work, general contamination of the canyon and crane was experienced. On 11-8-57, the entire canyon was washed down with the canyon roof sprays as a start toward removal of the contamination. A special cleaning program on the crane has also been started and will continue during the coming months. In all probability a significant cleanup program comparable to the program conducted in May, 1957 will be necessary to restore satisfactory contamination and radiation control.

## 2. Equipment Experience

### a. H-4 Oxidizer Pot

The H-4 metal solution oxidizer developed a leak approximately 30 inches from the bottom of the pot during the latter part of October. Use of the oxidizer was continued to the end of October by making up short batches, thus keeping the liquid level below the leak point. Replacement of the pot was started on 11-1-57; however, due to installation difficulties the job was not completed until 11-9-57. The trouble was caused by the lagging insulation on the bottom of the pot which held the pot several inches higher than its normal position. As a result, most of the tank jumpers would not make up. The problem was overcome by filling the tank with water and allowing to stand for 36 hours. The added weight was sufficient to compress the lagging and allow the pot to settle enough that most of the old jumpers could be installed. However, it was necessary to fabricate six new jumpers, with vertical lengths 1/4 to 3/4 inches shorter than normal before the installation was completed and satisfactorily tested. This is the fifth time the H-4 oxidizer pot has been replaced since Redox startup. The removed pot had been in service since 1-10-56.

### b. H-4 Agitator

When the agitator was removed from the old H-4 oxidizer, the impellers were found to be severely corroded. A new Falk Company five horsepower agitator was installed on 11-2-57.

### c. Silver Reactor Regeneration

The A-3 and C-3 iodine silver reactors were regenerated on 11-10-57 and 11-24-57, respectively. This was done as a precautionary measure since some evidence of Iodine-131 breakthrough was indicated.

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d. Air Receiver - Ozone System

Since the Hy-Tor Compressor Receiver Tank did not have an "Underwriters Approval Tag" a replacement unit was installed as a precautionary measure. The work was done by Minor Construction forces and the costs were charged to the original project.

e. Additional Canyon Equipment Replacements

<u>Equipment Piece</u>	<u>Date Replaced</u>	<u>Reason</u>
Jumper from F-7 Feed Tank to LA Column	11-15-57	Leak at flow controller valve.
2D Column Letdown Valve	11- 4-57	Erratic operation
D-14 Condensate Outlet Jumper	11- 4-57	Excessive leak
Recirculation Jumper Ruthenium Scrubber (H-5)	11- 8-57	Leak at connector head and inoperable flow meter.
H-5 Thermohm Jumper (Ruthenium Scrubber)	11- 8-57	Thermohm failure.
A-3 Dissolver Off-gas Thermohm Jumper	11-21-57	Thermohm failure.
D-14 Backcycle Pump	11-30-57	Frozen shaft bearing.

f. 60-Ton Canyon Crane

Considerable difficulty was experienced this month with equipment failures on the 60-T Crane. On 11-6-57 a new left hand impact wrench was installed because of an electrical failure. On 11-12-57 the electrical cable to the charging wrench separated at the clamp on the wrench swivel. A short section of defective cable was removed and a new connector plug installed. On 11-13-57 the right hand cell wrench was changed out due to an electrical failure. In all cases high radiation levels were encountered but the repairs were made without incident.

B. Maintenance Operation

The facility operated at a mechanical efficiency of 75% during the periods of scheduled operation.

The modified Peerless open head type pump which was installed

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in the D-14 position on October 18, 1957, in an effort to resolve the frequent pump failures in this position, failed due to a frozen shaft on November 30, 1957. Actual operating time was 37 days. The modified pump was designed with a throttle bushing clearance of 0.010 inches, a 7½ H.P. motor, and an additional roller bearing to properly stabilize the shaft. Although the pump life was 37 days as compared to an average of 20 days for recent D-14 pump installations, it is obviously not the answer to the problem. The failed pump has been moved to the 221-U Canyon Building for decontamination and disassembling in an effort to determine what caused the pump failure and what can be done to remedy the problem.

On 11-27-57, a 440 volt fuse blew in the primary circuit of the 440 volt to 220 and 110 volt transformer for the instrument supply to K panel in the 202-S Building. Apparently the only equipment affected was pulser pump 702-A which ran at a reduced speed. To change the fuse it was necessary to open the 440 volt switch in order to get the interlocked door of the switch box open. K panel was switched to manual control during the interim period and no processing interruptions were encountered.

The equipment being installed in the L-F side of the multi-curie section in the 222-S Building, to experiment in the recovery of fission products, is about 50% completed. It is anticipated that this will be ready for operation by December 15, 1957 depending upon delivery of off-plant materials. Primarily, the equipment consists of three columns, three pulse generators, eight feed pumps and tanks, and one heat exchanger, all of pilot plant dimensions.

C. Waste Handling and Decontamination Operation

1. Waste Handling

a. <u>200-East Area</u>	<u>Gallons</u>
Waste Scavenged	780,000
Waste Received (Purex Coating)	133,000
Waste to Ditches	824,000
Waste Transferred From C Farm to BY Farm	
Purex Coating	185,000
Purex Start-up	429,000
b. <u>200-West Area</u>	<u>Gallons</u>
Redox Coating Waste Received (S Farm)	26,122
Redox Salt Waste Received (SX Farm)	179,526
Total Gallons Boil-off Salt Waste	191,090
Waste received at TX Farm (221-U Waste)	23,375

2. Equipment Decontamination and Repair

a. Regulated Steam Pit

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A total of twelve vehicles and seven pieces of equipment were decontaminated during the month. The total manhours charged to this operation was 168.

b. Railroad Equipment

A total of 160 manhours was charged to railroad decontamination work and timekeeping at Riverland. The work included replacement of a Chalk River flatcar bed and decontamination of Engines No. 19 and 30.

c. 221-U Building

1. Chalk River Casks

Four "J" casks and two scrub casks were received from the 100 Areas for decontamination and repair. Internal readings were reduced sufficiently to allow contact maintenance work on the casks. All mild steel studs for the "J" cask lids were removed and replaced with stainless steel studs. All casks were then decontaminated externally to less than 100 c/m smearable and returned to the 100 Areas. A total of 222.7 hours was charged to this operation.

2. Finished Products Operation Equipment

Eighteen small hubs from process valves in the 224-U Building were decontaminated and repairs were completed on the X-30-2 pump at an approximate savings of \$2775.

3. Redox Operation Equipment

One jumper from the 241-S Diversion Box was decontaminated and regasketed at a savings of \$250.

4. Purex Operation Equipment

Decontamination of the J-1 pump was completed and disassembly for inspection and repair was started.

5. Miscellaneous

Decontamination and release of the areas contaminated as a result of the Redox H-Cell equipment burial was accomplished during the month. A complete write-up of the burial box incident has been issued under separate cover.

One cask car lid was decontaminated in preparation for repair work.

3. Waste Scavenging

A total of 780,000 gallons of waste was scavenged during the month and represents 92% of the production forecast. There

were no equipment failures which hampered the operation during the period. Approximately 720,000 gallons of waste remains to be scavenged to complete the program in 200-East Area.

Excavation of trench No. 22 was started during the month and is scheduled for completion early in December, 1957. This ditch will allow disposal of the remaining scavenged waste in 200-East Area.

#### 4. Redox Waste Handling

A total of 26,122 gallons of coating waste and 179,526 gallons of salt waste was received during the month. Total boil-up of salt waste was 191,090 gallons.

Leaking jumpers in the 241-S Diversion Box caused considerable maintenance work during the period. However, this did not interfere with the continuity of operations in the Redox Plant.

The instrument air dryer at the 241-SX Tank Farm was installed and put in service on 11-4-57. The effectiveness of this unit has not been determined to date due to mild weather conditions; however, it is felt that the dryer will eliminate the condensation in the instrumentation system.

#### 5. Purex Waste Handling

A total of 133,000 gallons of coating waste was received at the C Tank Farm during the period. 185,000 gallons of coating waste and 429,000 gallons of start-up waste were pumped from C Farm to the BY Farm for permanent storage, thereby providing the Purex Plant with tankage space for sometime after completion of the waste scavenging program.

#### 6. Miscellaneous Activities

Fourteen 55 gallon drums of liquid chemicals (caustic, nitric, sulfuric) were filled for various customers during the month. Customers now include the following; 105-KE, 105-KW, 100-B, 100-C, 300 Areas, 234-5 Bldg., and the 224-U Bldg.

### D. Analytical Control Operation

#### 1. Control Statistics

<u>Month</u>	<u>Samples</u>	<u>Determinations</u>
October	2847	7497
November	2912	7057

#### 2. Building Maintenance

Principal 222-S Building maintenance included replacement of the 219-S cell vent motor, repair of the hot waste jet in the hot

tunnel, installation of a 100 ampere electrical service pending installation of the ultrasonic cleaning apparatus, and modification of controls on the preheat coils in the air conditioning system to prevent frozen coils during cold weather.

### 3. Equipment

Four days of down time was experienced with the uranium reactivity apparatus for repair of the furnace temperature controller and the replacement of thermocouples.

### 4. Assistance to Process

A study involving the particle size determination on  $UO_3$  powder revealed that the heating step in the procedure could be eliminated. The decrease in elapsed time in reporting results will be beneficial during periods of operating difficulties.

Acceptable estimates of nitric acid in the Redox inert gas were obtained after much difficulty with sampling and analyses. Recommendations were made for improving the spray washing of the gas to minimize nitrate content.

Working in conjunction with the Process Chemistry Group of the Research and Engineering Operation a series of 36 samples, pertaining to the uranium final product from the Purex Plant, was assayed for Plutonium and Neptunium in an effort to determine the cause of a high alpha count. Results have been forwarded for evaluation.

### 5. Analytical Procedures

Assay methods for controlling the Redox Plant Nitric Acid Recovery Facility were provided and placed in service after an extensive training program. Determination of dissolved oxides of nitrogen in the absorber bottoms was an unforeseen need. Since it is felt that these could possibly cause deposition of Plutonium in the process, an effort is being made to devise an analytical method.

A procedure for the fluorimetric determination of Uranium in high salt tank farm samples has been prepared. Repeated additions of hydrofluoric acid and evaporation are used as the means of removing nitrates which were the major source of poor precision in these assays.

## E. Radiation Monitoring Operation

### 1. Radiation Occurrence Experience

Ten radiation occurrences were reported in the Redox Operation this month. Half of the radiation occurrences were related in

some manner to the contamination problems in the Redox canyon and the process equipment burial which caused a contamination spread at the burial garden. By month end the burial gardens area was restored to an operable condition and the necessary controls to maintain adequate radiation protection to personnel and equipment were implemented as necessary. A separate report was issued covering the details of this burial. There were three cases of skin contamination related to crane cab entries as a result of the canyon contamination problems. There was one radiation occurrence involving a process blow back on the F-1 pH metering system. There were four radiation occurrences related to adherence to Radiation Work Procedures and appropriate corrective action was taken where necessary.

## 2. Personnel Exposure Experience

Two burials were conducted during the month, one of which was an H-4 tower which had been in dead storage for approximately two years. The radiation levels through one foot of concrete was 150 mr/hr at 50 feet. A second H-4 tower now held in dead storage (removed from service on 1-10-56) measures 50 r/hr at 60 feet. This H-4 tower will remain in storage for additional radioactive decay.

The Redox canyon was flushed using the canyon washdown system and as in the previous washdown considerable contaminated water escaped from expansion joints in the operating and pipe gallery areas. The crane maintenance platform and the crane were decontaminated as time permitted during the month in personnel dose rates of 500 to 3000 mrad/hr.

## 3. Other Contamination Problems

While the Redox crane decontamination work was in progress approximately 14 curies of iodine was emitted to atmosphere. Although the circumstances could not be verified it is probably that the emission was caused by the crane decontamination solvent entering the air tunnel and then to the sand filter. A similar iodine emission problem had occurred during the May decontamination program. A special air sampling program will be initiated across the sand filter to determine the amount of iodine entering and leaving the sand filter to pin point the cause of these unexplained iodine emissions. There was no evidence at any time that the iodine emission was caused by the dissolver operations.

The 293-S Iodine Removal Facility continues to operate satisfactorily from a radiological standpoint and the maximum radiation levels measured were 50 mr/hr on the incoming dissolver off-gas lines. The 293-S Building is still essentially contamination free.

## F. Improvement Experience

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1. Process Tests and Revisions

Information related to this item is covered in the Research and Engineering portion of the Department Report.

2. Miscellaneous Improvement Items

A recycle pump, to be used for the internal decontamination of pumps, was fabricated and put into service this month by the Redox Waste Handling and Decontamination Operation. Initial results have been promising and testing will continue during the coming month.

The controls on the preheat coils in the fresh air supply units of the 222-S Building were modified such that the condensate temperature rather than the coil temperature controls the steam flow. This arrangement should eliminate the trouble encountered during previous winters of having the coils freeze up.

During the month a leak developed at the connector head of a cross-box jumper in the 241-S diversion box. If possible, regasketing is normally done in the field. However, if radiation levels are prohibitive a new jumper is fabricated. In the instant case the jumper was reading 2R at 40 feet and regasketing in the field was impossible. The jumper was moved to the 221-U Canyon Building, decontaminated, regasketed, and reinstalled at a cost of \$700, or a savings of \$250 over the cost of a new jumper. This saving was accomplished with little planning due to the immediate need for the jumper. Any future regasketing of Hanford Jumpers can probably be accomplished for a maximum of \$500 or a savings of approximately \$450 over the cost of a new jumper.

3. Inventions or Discoveries

There were no inventions or discoveries of a patentable nature reported in the Redox Operation during the month of November, 1957.

G. Events Influencing Costs

Two equipment burials were conducted during the month. Unrepairable and grossly contaminated capital equipment valued at \$59,394 was thus removed from the Redox capital investment.

A total of fourteen people were loaned to the Finished Products Operation for eight hours each during the month, thus reducing the manpower cost in the Redox Operation.

An increase in analytical work load from the Chemical Research Operation of the Hanford Laboratories Operation amounting to an estimated 100 hours per month is expected in mid-December. This will be in support of work toward fission product recovery and is expected to last

from six to twelve months.

In answer to our request, Process Chemistry, Research and Engineering Operation has made a preliminary investigation of the analytical effect of processing enriched fuels. Although sampling and analytical schedules are not yet known, it has been determined that any specialized analytical request for the next four years (determination of Pu and U isotopes) can be handled by the Hanford Laboratories Operation as a service with no capital investment required. However, if present schedules are maintained it will be necessary to place orders in 1962-63 for a thermal emission spectrometer and a 20 channel alpha energy analyzer costing an estimated \$85,000 and \$15,000 respectively (1957 dollars).

## H. Plant Development and Expansion

### 1. Preparatory Engineering

#### Cask Car Contamination

Three process casks have been decontaminated and have had the drainage plugs removed. Two types of flushing heads have been fabricated and tested. This program is intended to minimize cask car contamination at the source while the project proposal for hinged lids is under preparation. The design of a hoist and monorail for removal of cask car well lids in the railroad cut is still in the preparation stage.

#### 222-S Laboratory Roof Fire Protection

The project proposal CG-783 has been approved by General Electric and submitted to the local AEC for their approval.

#### In-Concrete Piping Failures

The Resistoflex representative, Mr. Robert Swan, met with FEO and CEO representatives to discuss the possible application of their product, Fluoroflex, for lining the failed piping in concrete. The problem was entirely new to Mr. Swan in that the piping has a compound bend and is inaccessible from one end. He will present the problem to the Resistoflex Research Laboratory in New Jersey. Meanwhile, no further testing of the fixed piping will be attempted and all efforts will be expended toward developing a solution to the known problem.

### 2. Design and Liaison

#### 202-S Building Occupancy

A design order was issued to the Facilities Engineering Operation to prepare an informal request for funds providing adequate maintenance oil storage and painting facilities. Unused areas in the North Switch Gear Room and the No. 2 Blower Room will be utilized.

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CG-621, Redox Contamination Control

The canyon washdown system of the project was retested on 11-14-57 and the whole project, as revised, was accepted. Operating procedures for the washdown equipment were revised and submitted to the Redox Processing Operation. This is a final report.

CG-648, Redox Auxiliary Iodine Removal and Nitric Acid Recovery

With the clean up of a few minor items by CEO and Plant Forces, the project will be complete except for the installation of metering devices in the acid return lines to the dissolvers. The meters are on order and should be installed sometime in January, 1958. The delay has been caused by the timing of project CG-722 which was to have furnished these instruments. On November 13th, the facility demonstrated the ability to perform as expected. Greater than 50% acid was produced with all three dissolvers on the line with control on "automatic". A full evaluation of iodine absorption has not yet been made. Recovered acid of approximately 52%  $\text{HNO}_3$  is being reused on a batch addition basis. Control instruments for the operation of 293-S are still in the adjustment stage, though the operation of the building is considered near satisfactory.

CG-722, Utilization of 224-U Acid at Redox and Purex

The project proposal has been approved by General Electric and submitted to the local AEC for their approval. The utilization of  $\text{UO}_3$  recovered acid in the 202-S Building, on a temporary basis, has been studied to assist in easing the impending lack of storage at the 224-U Building. Two temporary alternates have been presented to the Facilities Engineering Operation for consideration, utilizing project funds. Beneficial use of the facility at the proposed 204-3 tank system could be expedited for temporary acid trailer usage or installation of an unloading line to the 293-S Building acid storage tank.

CG-692, Modifications to Redox 233-S Concentration Building

A revised official construction schedule is being submitted to the Commission for approval. The auxiliary exhaust system has been installed. The first level of catwalk has been erected in the process area. The cutting of doorways through concrete is being held up pending the delivery of Robertson siding for the stairwell and storage area. The stairwell siding must be installed before the doorways can be cut.

I. Reports Issued

No secret reports were issued by Redox Operation personnel during the month of November, 1957.

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III. ORGANIZATION AND PERSONNEL

A. Safety

There were no disabling injuries, serious accidents or incidents in the Redox Operation during November, 1957. Eleven medical treatment injuries were reported during the month.

B. Security

There were no security violations in the Redox Operation during the month of November, 1957.

C. Personnel Activities

On November 7, 1957, four members of the Oak Ridge National Laboratories visited the Redox Facility for the purpose of inspecting remote maintenance facilities and procedures. They were David W. Campbell, Donald M. Shepard, William S. Hornbaker and Edward A. Franco-Ferreira.

A group of 19 scientific and technical personnel from Washington D.C. were conducted on a tour of the Redox Plant on November 4, 1957. A luncheon and discussion meeting were held in the 202-S Building lunch room following the tour.

*Chas. S. Smith*  
Manager  
Redox Operation

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HW-53967 DEL

**CHEMICAL PROCESSING DEPARTMENT  
FINISHED PRODUCTS OPERATION  
MONTHLY REPORT**

**NOVEMBER 1957**

**I RESPONSIBILITY**

The Radiation Monitoring Operation has assumed the responsibility for the monitoring of the Construction forces who will be working in those areas where the Finished Products Operation has landlord responsibility.

**II ACHIEVEMENTS**

**A. Metal Finishing Operation**

It was mentioned last month that certain goal commitments had been established earlier in the year for the output of the Redox and Purex plants in the fourth quarter of calendar year 1958. The scheduling to achieve these goals again resulted in establishing a new high for plutonium feed for Metal Finishing, in November. Feed was received from Purex until November 27, when a scheduled outage for equipment modification started. Redox started delivering feed about the middle of the month and continued for the remainder of the month. The quality of the plutonium metal received from both plants was very good, and no complications resulted during the processing of this material which could be attributed to the feed.

All plutonium from the primary plants and the recovery operation was converted to the metal for shipment offsite, unfabricated. The good supply of feed mentioned in the previous paragraph made it possible to set a new production record for the preparation of buttons. In fact, enough metal was produced to satisfy the commitment for the current month as well as to compensate for earlier underages. The new record for button production was 13% higher than the previous high.

As in October, all production was scheduled through the new continuous Task I and II equipment. No material other than a small amount of scrap and off-standard plutonium destined for recovery was processed in the old equipment. The continuous wet and dry chemical equipment functioned better this month than it had previously. The quality of the metal produced from the plutonium fluoride, from the continuous unit, was very high and fewer buttons were lost due to density specifications. The very few buttons which had low density had a higher iron content as determined by analysis. These came, mainly, during a period when trouble was being experienced with wet cakes.

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A. Metal Finishing Operation (Cont'd)

It was necessary to shut down the Task I and II equipment in Hood 9B on November 12, for four days when packing gland leaks developed and allowed excessive quantities of oxalate slurry to leak from the process equipment and collect on the floor of the Hood. The suspension of operations was necessary to allow time for cleaning the hood and removing the plutonium oxalate cake in order to maintain critical mass control, and reduce exposure to people working near the hood. Corrective action to prevent a recurrence of this type of incident is underway and includes the establishment of operating procedures which require the prompt shutdown and repair of leaks as soon as they are detected, as well as frequent scheduled inspections designed to detect leaks. Revision of the equipment to eliminate leak points will take place early in December when improved equipment is ready for installation.

A rather serious contamination spread developed in the Zone 3 area of the Task III, reduction operation, about the same time as the outage discussed in the previous paragraph. Leaks developed at hood joints, and liquids such as pickling solution, were allowed to run on to the floor in the work area. The contamination was confined to the Task III area but was of such a magnitude that operations could not be conducted unless HAFU Radiation Work Standards were compromised. Actually, a six day delay of all Metal Finishing activities could have been attributed to this contamination spread if other troubles were not encountered simultaneously.

B. Product Recovery Operation

Approximately 32.8 Kgs of plutonium were recovered through Recuplex and most of this was processed under modifications of the 16-crucible flow sheet still under test. Most of the runs had to be tailored to fit batch size limitations. Operations were curtailed for 16 hours for the replacement of the H-2 column bellows. Four days down-time were experienced when personnel were loaned to the Metal Finishing Operation to assist in their work. On November 27 an exhaustive flush of the entire Recuplex system was initiated and is still in progress. The purpose of this flush is to clean up residual solids which have caused excessive column flooding.

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B. Product Recovery Operation (Cont'd)

A four-ton tail gate lift loader truck was delivered on November 27 for the purpose of placing hauling of product containers on a straight-day basis, thus a net of two people will be free for reassignment.

The following operating statistics are tabulated:

	<u>October</u>	<u>November</u>
Dissolver Runs Completed	15	41
Recuplex Column Operating Efficiency	58.3	64.8
Ave. Instantaneous Rate (Liters/Day)	1914	1825
<u>Ca.</u> Kg Processed Through Recuplex	31.1	32.8
<u>Ca.</u> Kg Metal Scrap Recovered	10.7	17.0
% Waste Loss from Columns	0.9	0.84

C. Uranium Reduction Operation

The Uranium Reduction Operation produced 101% of commitment during November, all of which was approved for shipment. All shipment schedules were met. A total of 452,242 lbs. of 100% nitric acid was sent to Purex during the month. At month end a backlog of 178.4 tons of uranium as UNH is on hand at various sites awaiting processing at 224-UA.

Following a scheduled thirty-six hour shutdown early in November, considerable difficulty was encountered in getting restarted. The major cause of trouble was attributed to frozen feed lines in the feed boxes. During the shutdown, the normally used feed tank (X-30) was deactivated and the secondary (X-19) feed tank was tied into the feed loop header. Some instrument troubles on this second tank was the major cause of trouble. The new feed filter system currently being installed on the X-30 tank should be activated during December.

K calciner was restarted following the installation of a new shaft, and new agitator assemblies. Some bearing troubles occurred on this unit during the month. Although it operated only eight days during the month it is running well at month end.

L calciner sustained severe damage late in November when an agitator arm broke causing at least ten other arms to fail. This unit is being completely overhauled, with all late modifications being installed, including a complete new feed "hot box" assembly (Project CG-770). This unit should be ready to go back into service by December 10.

The replacement, strengthened agitator assemblies, currently installed in H, and K cells (and being installed in G cell) continue to give very satisfactory performance.

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C. Uranium Reduction Operation (Cont'd)

Calciner statistics for November are as follows:

<u>Calciner</u>	<u>Days Scheduled</u>	<u>(1) Days Operated</u>	<u>Ave. Rate (II) per Oper. Day</u>	<u>Ave. Rate (II) per Sched. Day</u>
G	28.5	27	5.45	5.14
H	28.5	24	5.24	4.50
J	28.5	22	4.41	3.42
K	28.5	8	3.25	0.96
L	28.5	20	3.58	2.46
M	<u>28.5</u>	<u>26</u>	<u>5.24</u>	<u>4.71</u>
Totals	168.0	127	4.76	3.60

On line efficiency - per day (I) Basis = 74.2% hourly, Basis 66.8%

Notes: I. Operating day is designated as 24 hour period from 8:00 a.m. to 8:00 a.m. If a unit is in operation for any part of this period it is constituted as having been in operation for that day.

II. Rates based on output.

Generally speaking, operations were satisfactory during the month with actual mechanical troubles being few as compared to other months. The off-gas wet filters worked well, and only a minor amount of trouble was incurred on remill problems.

D. Maintenance Operation

Z Plant

In Task I maintenance has consisted of replacing and repairing manual and air operated valves. Maintenance time expended on this Task was approximately 0.5 man per month as opposed to approximately 2.5 men per month for May and June of 1957.

In Task II six new panels were installed on Hood 9. This was necessary to improve the visibility of the inside of the hood, in connection with the cleanup of the hood, prior to removal. Minor repairs were necessary to correct a bent carriage to permit recycling or drying of material removed from Hood 9B.

Hood 9B operation continues to be erratic and requires an abnormal amount of maintenance manpower to assure operation and effect revisions. The major portion of the work on Hood 9B was as follows:

The variable speed motor on the reactor agitator was replaced with a Thymatrol controlled motor to eliminate constant motor failure from worn brushes.

D. Maintenance Operation (Cont'd)

Z Plant (Cont'd)

The Treet-O-Control unit, originally installed on the feed pump located in Task I, was exchanged with the constant speed control unit used on the feed pump in Hood 9B. This change will permit variable feed control, on the plutonium stream to the reactor.

The 350 rpm drive on the fluorinator discharge valve was replaced with a unit driving at 12.75 rpm's. This was done to reduce wear on the valve.

The fluorinator discharge valve was modified by replacing teflon bearings and seals with fluorathene seals and oilite bearings. A vibrator was attached to the valve in an attempt to provide continuous powder flow through the valve.

It was necessary to replace the filter cloth on the vacuum drum filter once during the month.

Two vacuum drum filter slide valve wear plates were replaced during the month.

The rotary drum filter agitator has required considerable maintenance to control leakage through the shaft packing glands. Several types of packing have been tried with best results obtained with Garlock 733, lattice braid pre-formed packing.

The banjo valve failed once this month due to plugging and was removed, cleaned, and returned to service.

Three carbon filters were replaced in the fluorinator off-gas filter this month. Two were broken while cleaning and one apparently cracked while in service.

The use of radiator hose impregnated with paraffin is quite satisfactory. This type of flexible connection is presently being used in the fluorinator discharge and required replacement once this month.

An experimental monel bellows was installed in the fluorinator feed early in the month and up to this time has given satisfactory service.

Flood lights were installed around the walls of the 9B Hood room to provide adequate lighting of equipment inside Hood 9B.

It was necessary to remove and clean the hydrofluoric acid rotameter and repair a leak at the inlet to the rotameter.

The oxalic acid feed rotameter was removed, cleaned and recalibrated.

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D. Maintenance Operation (Cont'd)

Z Plant (Cont'd)

Some leakage of hydrofluoric acid gas has been observed through the control valve and shutoff valves in the HF lines. Lead lined valves have been ordered to replace the shutoff valves to provide positive shutoff of the HF when desired.

In Task III the conveyor drive motor for Hood H-11 failed through worn gears in the gear head. New gears were fabricated in the P & M Shop and installed. The unit was returned to service. Due to erratic operation, caused by short plateaus, it was necessary to replace T.W.G. tubes on CRM units 1 and 2.

In Task IV a ruptured Meletron pressure switch resulted in considerable leakage of cooling water. In general, little maintenance was required on equipment in Task IV this month.

In Task V a new set of gears was fabricated in the P & M Shop and installed to replace worn gears in the hemisphere lathe in Hood 200 A. The 5B Hadley balance and valve cabinet were removed from their location on the RMA Line to make space available for the new Pit 65 machining hood. The Pit 65 machining hood was moved from the P & M Shop and temporarily located and electrically connected at Task V for training purposes.

In Task VII three failed heat traps were replaced. The temperature instruments on all coating units were calibrated. It was necessary to replace the thermocouple on Unit 3 to obtain satisfactory calibration. Considerable trouble is currently being experienced with the express cars due to worn parts. The best portions of express cars 2 and 3 were combined in an effort to obtain a trouble free unit.

In Recuplex it was necessary to replace bent shafts on K-9 and D-9 agitators. The H-2 column pulser bellows failed and were replaced. Considerable trouble has been experienced with the J-3 circulating pump due to erratic operation. A new pump was obtained, run-in in the shop for 48 hours and then installed in hood. The pump failed due to frozen bearings after less than one hour's service. Another pump was obtained and sent to 300 Area for a run-in period using nitric acid. This pump will be installed when it is returned.

In the Analytical Control Laboratory burned out heating elements were replaced in the muffle furnace located in room 156. In addition, the source and source holder were removed from Final Inspection, sent to 300 Area where a source of greater intensity was installed. The new source and source holder were returned and reinstalled.

The Plutonium Metallurgy Operation has recently been given the assignment of developing and manufacturing fuel elements on a very rigid time schedule. To effect the successful completion of this

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D. Maintenance Operation (Cont'd)

Z Plant (Cont'd)

Assignment Maintenance, Finished Products Operation, has been requested to modify, adapt and place in operation available equipment such as rolling mills, extrusion presses, vacuum systems, lathes, grinding equipment, milling machines, furnaces, plutonium ejection systems and welding equipment which will permit the Plutonium Metallurgy Operation to complete their assignment on schedule. The majority of the maintenance work for this month has been directed toward achieving the above assignment.

In the Research and Engineering Operation the installation of all services to the four hoods installed in Room 188 was completed.

In Z Plant general, the replacement of the leaking reheat coils for supply fan unit 4 was completed. In addition all leaking headers and discharge piping was replaced. It was necessary to repair two leaks on the 234-5 high tank steam trace line this month. One was located directly under the tank and the other underground near the french drain. Filters were replaced in the Task II primary filter box and in Filter Box #8.

U Plant

The maintenance repair work at the UO<sub>3</sub> Plant continues to be excessive although definite progress has been made on equipment improvements. The UNH Feed System is a major trouble spot at this time. However, this condition will be greatly improved when the UNH Feed Filters and Hot Box revisions are completed. The UNH Feed Filters are complete and will be put into operation the first of December. All Hot Box revisions will be completed during January 1958.

To correct the calciner agitator breakage problem newly designed agitator assemblies, with greater strength, are being fabricated, and will be installed as production activity will permit. These improved agitator assemblies have been installed in H and K Calciner, and work is in progress to equip L Calciner with this type agitator assembly.

The major portion of the maintenance manpower was used as follows:

- Replacement of J Cell ACA Motor
- Rebushing of five ACA Motors
- Bearing replacement on the X-4-1 exhaustor
- Piping replacements and repairs on the propane gas system
- Winterizing and repair of steam leaks
- Instrument recalibration including transmitters, recorders, and level indicators
- Print scale repair
- Repair, replacement or clean out of valves, rotameters and feedpoints

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D. Maintenance Operation (Cont'd)

U Plant (Cont'd)

- Feed pump replacement
- Agitator shaft replacement and gasket repair, K Cell
- Agitator shear pin replacement, H Cell
- Agitator assembly replacement, L Cell

The L Cell replacement work is continuing at month's end and the following improvements will also be completed during the down time: relocate and strengthen feed thermohm nozzles, pin calciner shaft expansion joint, revise bearing housing to permit expansion, install a complete set of revised agitator assemblies and install revised feed Hot Box piping.

Equipment improvements were achieved by removing the oil cooling systems to the calciner bearings. These units are not needed because the oil pressure systems have been discontinued (now using a conventional oiling method). Additional improvements have been made by installing a new sprocket to increase the speed of the X-26-1 rotary valve, new vertical type pump in the C-2 Tank, the automatic switching device on the tie breakers to main electrical feed to 224-UA Building, and the reversing limit switches on X-28-1 blow ring drives. Hot Box revision work is progressing on schedule. One left hand box and one right hand box are ready for installation.

E. Analytical Control Operation

A total of 8858 determinations were performed on 1547 samples received in the Analytical Laboratory during the month. The Laboratory was able to furnish results in all cases so that production activities were not held up.

In Product Inspection, 19% of all parts received were rejected because of chemical, dimensional, and coating defects. This is an improvement of 10% in the rejection rate and represents only 14% of all inspection time which was lost to rejects as compared to 20% last month. During the month a trend towards the maximum pole to plane dimension developed. On these parts it was necessary to determine actual measurements by means of the sweep gauge, whereas, normally a "Go" template measurement has been sufficient.

Installation of the new Co<sup>60</sup> source was completed as planned. The increased activity of this source enables us to reduce radiographic exposures on 200 models from 90 minutes to 13 minutes.

F. Radiation Monitoring

Twenty-one radiation occurrences were documented in November as compared to twenty-one in September. The breakdown for the various Operations is as follows: Metal Finishing - 8, Product Recovery - 1, Maintenance - 6, Analytical Control - 2, Uranium Reduction - 4, and Radiation Monitoring - 0.

F. Radiation Monitoring (Cont'd)

Twenty-five cases of skin contamination were reported in November as compared to twenty-five cases in October. The breakdown for the various Operations is as follows: Metal Finishing - 9, Product Recovery - 1, Maintenance - 11, Analytical Control - 3, Uranium Reduction - 1, and Radiation Monitoring - 0.

Three process operators in the Metal Finishing Operation have now exceeded the 3 r/yr. penetrating exposure limit. The rate of exposure accumulation has essentially doubled since the middle of October (50 mr/week per operator before October 16th, 110 mr/wk per operator afterwards) thus making an already serious exposure problem much more severe.

Three plutonium contaminated medical treatment injuries were experienced by FFO personnel during the month. It appeared that at least one of these will probably result in slight internal deposition but would not cause any necessary restrictions.

The stack emission problem showed further improvement. Daily emission averages for September, October, and November were 175, 100, and 52 uc/day respectively. The principle source continues to be Hood 9 in Task II. When this is removed stack emissions should fall sharply. It is also expected that during final cleanout of this hood emissions to atmosphere will increase markedly.

A severe contamination spread in Task III of the RM Line necessitated a week's shutdown until the problem could be brought under control. A leak in the pickling hood was the source of the spread and at month's end it appeared that attempts to plug it had been successful. Some traces of the contamination spread remained at the writing of this report.

Several severe blow backs contaminated many normally clean areas in the 224-UA Building during November. The causes were believed to have been determined and a reduction in number of these occurrences should be noted in the future. Most of the area have been decontaminated.

G. Improvement Experience

1. Process Tests and Revisions

Information relating to this item will be covered in the Research and Engineering portion of the Department report. Other information concerning Weapon Data will be covered in a separate report to be written at a later date.

2. Inventions or Discoveries

On 10-3-57 C. F. Setbacken submitted an invention report covering a neutron monitoring device intended to control waste streams, etc. by determining plutonium concentrations.

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## H. Events Influencing Cost

In the Product Recovery Operation the replacement of shift men with a straight-day product container hauling operation employing a large tail gate lift-loader truck enables the freeing of two men for reassignment and other economies in time from various service groups engaged in this type of work. It is estimated that the savings will approximate \$16,000 per year.

At the UO<sub>3</sub> plant shift maintenance was discontinued for three crafts, and overtime safety meetings were also discontinued, both of which should have an effect on costs. Unit costs for October approached goal, but gross costs remain high reflecting continued high maintenance costs.

## I. Plant Development and Expansion

### 1. Project CG-691 - Improved Task I and II

Several improvements were made to the new equipment provided in Hood 9B to enhance the operability of this unit. The changes made were designed to correct difficulties in the offgas handling, inleakage and powder handling equipment. Work was started on the assembly of the 9A Hood and 7A Hood which will be installed permanently in the RMA Line. Preparations for the removal of the batch type dry chemical equipment were started.

### 2. Project CG-723 - Recuplex Conversion

The status of this project is essentially the same as reported last month. Plant forces are making plans for their portion of the work. Material procurement is underway. The physical start of the modifications planned will have to wait for the completion of the Project CG-691 work. The fabrication of vessels is proceeding as scheduled.

### 3. Project CG-734 - RMC Button Line

Design of equipment for the RMC button line is progressing on schedule. Procurement of the equipment is being arranged.

### 4. Project CG-756 - Z Plant Filter Replacement

The Construction Engineering Operation is proceeding on schedule with the fabrication and installation of their portion of the equipment part of this project. Most of the work done during the month involved dry stand pipes and the installation of a sprinkler system for the Store Room.

### 5. Project CG-613 - Hanford 4X Program - Metal Conversion Plant

The installation of instrumentation for the calciner wet scrubbers and the automatic bus switching for the 224-UA Building power were completed during the month. Still to be completed on this project are slide valve fabrication and calciner distortion instrumentation.

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I. Plant Development and Expansion (Cont'd)

6. Project CG-722 - Utilization of 224-U

Acid at Purex and Redox: Project Proposal, revision 2, requesting revised scope and total project funds, was transmitted to the AEC on 11-15-57.

7. Project CG-725 - UO<sub>3</sub> Plant Liquid Waste

Handling Facilities: This project proposal is awaiting approval by Chemical Processing Department management.

8. Preliminary Project Proposal CG-767 - UO<sub>3</sub> Plant Improvements

The scoping work on this project is continuing, and should be completed on a number of the items by December 15, 1957.

9. Project Proposal - Interim Segregation Facilities

The scope document was issued through classified files on December 2, 1957. Preparation of the project proposal estimates are in progress.

10. Project CG-770 - Feed System and Pickup Bin Modifications UO<sub>3</sub>

The UNH feed filter is ready for operational testing. The installation of loop header pressure and filter differential instrumentation remain to be completed. The mock-up of two feed box panel assemblies have been completed. The installation of the modified feed box in "L" Cell is scheduled to start December 2, 1957 and should be completed within two weeks.

11. Project Proposal - Powder Milling System, Modifications

The high estimated cost of this installation indicated the project could not be justified. The request has been cancelled.

12. Project Proposal - Conversion of Prototype Calciner to UO<sub>3</sub> Production Unit

The preliminary project proposal for conversion of the prototype calciner to a UO<sub>3</sub> production unit is circulating for Chemical Processing Department signatures.

13. Appropriation Request - Instrument Test Bench

An appropriation request for an instrument test bench to be used in conjunction with feed box instrumentation is processing through CPD Financial Operation.

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I. Plant Development and Expansion (Cont'd)

14. Appropriation Request - Fresh Air Supply

An appropriation request for monies to purchase and install a fresh air supply in the tower bag area, the air to be used in conjunction with bag changes, is processing through the CPD Financial Operation.

15. Engineering Study

An engineering study has been requested for recommendations for redesign of the existing structurally inadequate calciner feed points and thermowalls.

J. Reports Issued

HW-53696 Chemical Processing Department, Finished Products Operation, Z Plant Monthly Report, October 1957, by W. N. Mobley

III ORGANIZATION AND PERSONNEL

A. Organization Changes

G. E. Wilbur was upgraded from the non-exempt position of Radiographer to the exempt position, Specialist, Non-Destructive Testing.

B. Safety Experience

No disabling injuries or near-serious accidents occurred during the month. Fifteen medical treatment injuries occurred in November as compared with thirteen the previous month. The frequency rate increased from 2.26 to 2.75.

C. Radiation Experience

All significant information relative to radiation experience in the Finished Products Operation is carried in this report under Radiation Monitoring (Item II-F).

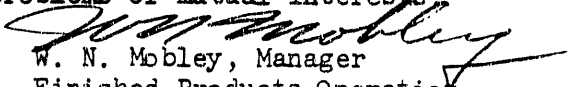
D. Security Experience

No security violations were experienced during the month.

E. Personnel Activities

Twelve employees attended the current Labor Relations Conferences. Twenty-one employees are attending the sessions on Management, Principles & Skills. Five clerical employees attended a special training session, General Electric's History, Growth, etc. Three employees attended "Time Card Chalk Talks".

Mr. Cliff Powell of the Carbide Nuclear Company of Paducah, Kentucky, spent two days at the UO<sub>3</sub> Plant discussing problems of mutual interests

  
W. N. Mobley, Manager  
Finished Products Operation

WNM:JPT:jjh

**CHEMICAL PROCESSING DEPARTMENT**  
**POWER AND GENERAL MAINTENANCE OPERATION**

NOVEMBER 1957

I. RESPONSIBILITY

Responsibility was assumed for operation of the product transfer truck which transports processed materials between Purex, Redox, and the Finished Products Operation.

II. ACHIEVEMENT

A. Operating Continuity

Steam, water, and emergency electric service was supplied the prime production plants in sufficient quantities to sustain continuity of operation without interruption for the entire month.

B. Inspection, Maintenance, and Replacement

Services rendered the Redox Facility included the fabrication of two silver nitrate reactor towers, an off-gas filter, and the making ready of an H-4 pot.

One high priority assignment required of the Shops Operation involved the replacement of existing carbon steel studs in the casks of a Chalk River cask car, with studs of stainless steel.

Fabrication of the HA pulse column for the Purex Facility was completed and the unit delivered to the job site on November 25.

Work accomplishment in the sheetmetal craft included revisions to the ventilation ducts in "N" Cell in the Purex canyon and the installation of approximately 100 feet of 26-inch duct extending from 241-WR vaults to the exhaust stack. Air conditioning was provided to six new offices in the 202-S Building by installing extensions to existing facilities.

Significant work in the Rotating Equipment Shop was the making ready of nine pumps, two agitators, and the fabrication of a special turbomixer as required for the process plants.

Progress continued on the fabrication of 16 pipe jumpers for Project CG-686 (In-Line Monitoring at Redox). Fourteen have been completed to date. Other jumper fabrications included twenty for Redox and nine for Purex. On five occasions during the month the Pipe Fabrication Shop responded to requests to fabricate jumpers on an emergency basis as deemed necessary to assure continuity of operation of production facilities.

Radiographic films of the faulty piping inadvertently installed during construction of the Purex L-Cell package have been studied, and a conclusive evaluation of the damage is now complete. An estimate of funds and time required to effect repairs is forthcoming. From the results of this estimate will come the schedule for making corrective alterations.

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Mechanical failure of the stoker mechanism necessitated removal from service the No. 5 boiler, 200 West Power House. The trouble has been determined and corrected and the unit returned to service.

Seven employees received low level skin contamination and seven pieces of automotive equipment were contaminated as a result of an incident involving the release of airborne contamination in the northwest corner of the 200 West Area on November 6. A standard burial box, containing defective and highly contaminated equipment from the Redox canyon, encountered damages while being loaded on a railroad flat car. The box later collapsed while in the process of being buried. It was concluded from observations that damages to the locking mechanism of the burial box lid was the principal contributor to the incident.

A survey of ventilation conditions at the front and rear faces of the 105-B pile, and at 105-KE and 190-KE Buildings, were the most significant services rendered the Irradiation Processing Department by the Power Engineering Operation.

C. Improvement Experience

Further reduction of personnel during the month (seven net) will result in an annual savings of approximately \$35,000.

Suitable provisions were completed for housing the 200 East Area paint and carpentry crews in the 275-E Building. The planned removal of these work shops from the 2101-M Building will localize shop-type activities in readily accessible areas for management purposes.

III. ORGANIZATION AND PERSONNEL

A. Safety and Security

The Operation incurred no disabling injuries during the month. Thirteen medical treatment cases were reported, which reflects a frequency rate of 2.96, an appreciable reduction as compared to the previous month's frequency rate of 5.95.

No security violations were in evidence.

B. Personnel Activities

One craft training session was held during November thus marking the close of the P&GM sponsored Craft Training Program for 1957. This self-development program was designed and presented to assist craftsmen and power operators in their desires for additional skill and knowledge. The program consisted of 46 separate sessions at which total attendance reached 708.

*T. G. Salotti*, Manager  
Power & General Maintenance Operation

CHEMICAL PROCESSING DEPARTMENT  
FINANCIAL OPERATION

November, 1957

I. RESPONSIBILITY

There were no significant changes in the responsibilities assigned to the Financial Operation during the month.

II. ACHIEVEMENT

A. Product Cost

October operating reports were completed and issued, within CPD, on November 8, 1957. This is the earliest issuance to date.

The Work Order Procedure was revised and issued to operating supervision during the month. The revision was necessitated by changes in IBM procedure which particularly affected the handling of cross orders.

A statistical study of the factors affecting 200E Power costs was completed and a Secret Rough Draft issued to explain the methods used and means of application of the study to practical forecasting problems.

With the assistance of Personnel Accounting a report, indicating the ratio of secretary and clerical personnel both to exempt and to total personnel, was prepared and issued.

A complete review of the cost results of Industrial Medical decentralization was prepared and forwarded to Employee Relations.

A source of cost report was issued for Facilities Engineering for October. All production and servicing operations are now covered by these reports, which indicate the organizational source of each incoming cost and the customer for each outgoing cost. This type of report implements investigation as to the propriety of service charges.

A saving of approximately \$400 was realized by a procedural change which eliminated the necessity of processing duplicating tickets through the computing services operation.

An additional step toward full responsibility accounting was taken by discontinuing prorations of E & PR and Financial Generals to 4th level operations. Each 4th level operating statement now reflects only partially or fully controllable costs in these two operations.

Work was completed on a mock-up of a flexible source of cost chart displaying the flow of costs for the Department and for each level 3



operation. The chart is designed with a series of transparent holders which allows the display of successive information sheets against a fixed transparent master. The transparent master represents end-functions for the entire Department, and each third level operation information sheet, when displayed against the master, is shown in its relationship to the total charging for the entire Department.

In collaboration with the Research and Engineering administrative analyst, R & E liquidating rates were reviewed and changes made to accommodate current staffing plans for FY 1958.

Preparation of the FY 1958 Midyear Budget Review was completed and required schedules were submitted on due date. Additional schedules were also submitted for analysis purposes. Estimates for production cost were \$1,335,000 under the FY 1958 Revised Budget. Quarterly costs presented in the Review are currently being broken down functionally by months for issuance on either the December or January operating reports.

Research and Development budgeted costs were up \$200,000 from the FY 1958 Revised Budget, reflecting the addition of the SS Materials management program and readjustment of overheads to agree with current rates.

October reduction in essential materials inventories was \$5,000 with a total since reorganization of \$583,000. The turn-over rate for October was 3.6 and 3.2, fiscal year to date, well in excess of budgeted turn-over rates. It is anticipated that the stock piling of coal designated by the Commission will cause an upward trend in our total essential material investment and a downward trend in turn-over. During the month of October the coal balance increased by \$14,000 but reductions in other items more than offset the increase. A margin for improvement in other essential materials, however, is now relatively narrow and it is unlikely that we will maintain a declining balance through the winter season unless an unusually cold winter is experienced.

An unusually high influx of purchases increased the CPD portion of the spare parts inventory by approximately \$76,000 during the month of October. This is not expected to be a continuing situation but relates mainly to special purchases of jumper parts (\$50,000) and above average maximum stock ordering.

The report covering the physical inventory of special materials was issued indicating a minor shortage (approximately .025% of book value). The shortage was applicable mainly to the failure to report certain small process and cleaning losses of platinum.

#### B. Personnel Accounting

The anticipated cost of G.E.'s Insurance Plan for 1957 has been less than expected and a corresponding reduction in the accrual rate for insurance costs has been designated. Benefit Plans makes payment each month, towards insurance cost, in an amount equal to total employee contributions plus accrual rate of 1.8% of that part of payroll gross identifiable as compensation, under the terms of the Pension Plan. Because of the reduced cost, the accrual rate has been reduced to 1.2%

retroactive to October 1, 1957.

Special year end jobs now being performed by Personnel Accounting are as follows:

1. Audit and identification of all excludable wages which must be reported as a separate item on form W-2 at year end.
2. Preparation of a listing of all participants in the Stock Bonus Plan showing total deductions as of November 30, 1957, in order to prevent any employee from exceeding the maximum annual contribution.

**Statistics:**

1. Number of CFD Employees

	<u>Monthly</u>	<u>Weekly</u>	<u>Total</u>
Employees at Beginning of Month	406	1 235	1 641
Additions and Transfers In	0	15	15
Removals and Transfers Out	(1)	(39)	(40)
Transfers from Weekly to Monthly	2	(2)	0
Transfers from Monthly to Weekly	(5)	5	0
Employees at End of Month	<u>402</u>	<u>1 214</u>	<u>1 616</u>

2. Overtime Payment During Month

	<u>November</u>	<u>October</u>
Nonexempt Employees	\$ 20 853*	\$ 15 393**
Exempt Employees	2 499	2 587
	<u>\$ 23 352</u>	<u>\$ 17 980</u>

\*Payments to nonexempt employees cover a five week period.

\*\*Payments to nonexempt employees cover a four week period.

3. Gross Payroll

Nonexempt Employees	\$ 771 364*	\$622 616**
Exempt Employees	312 209	318 149
	<u>\$1 083 573</u>	<u>\$940 765</u>

\*Payments to nonexempt employees cover a five week period.

\*\*Payments to nonexempt employees cover a four week period.

C. General Accounting

Forty-five voucher checks totaling \$215 149.59 were prepared by General Books during November, 1957. Included in this total were nine checks totaling \$133.68 for contaminated personal effects.

The General Ledger Trial Balance, Subsidiary Ledgers Trial Balance,

and reports of Travel and Living expense were delivered to Contract Administration on schedule.

Arrangements have been made to secure copies of freight damage and over-charge claims in addition to fare refund claims filed with carriers by Traffic Operation. This will allow General Accounting to make an accounting provision for the refund credit prior to the time the receivable is established, and will eliminate the necessity for phone calls when the receivable is established.

There were 29 active CPD projects with \$13 965 000 authorized funds as of October 31, 1957. Expenditures and commitments of \$10 232 000 and \$1 141 000, respectively, have been incurred against these projects. Cost of \$389 000 was incurred during October.

Project authorizations received from the AEC during November totaled \$1 019 600 consisting of: (a) \$65 000 increase in work authority for Expansion of 200 Area Facilities, (b) \$925 000 for providing facilities in 234-5 Building, (c) \$8 100 to perform services in connection with designing and construction of an office annex to the 234-5 Development Laboratories, and (d) \$21 500 for providing additional ventilation for Purex Pipe and Operating Gallery.

Preliminary cost closings were completed during November for Back-Up Radioiodine Removal Facilities - Purex - \$949 041 and Reduction of Air-Borne Noxious Fumes in 224-U Building - \$52 096.

The CWIP Plant and Equipment Changes in Progress Report and the Summary Cost Report and Estimate for October were delivered to Contract Administration as scheduled.

One project proposal and two project proposal revisions were processed and forwarded to the AEC. Total additional funds requested were \$369 500.

The Plant Acquisition and Construction mid-year Budget Review was completed and forwarded to Contract Administration. A reduction of \$5 077 000 was recommended from the previous budget submission.

Expenditure patterns for CPD projects were forecast, by quarters, through FY 1959. The total anticipated expenditures for the balance of FY 1958 are:

(Amounts in	1st quarter	\$1 207.5*
Thousands)	2nd quarter	1 183.9
	3rd quarter	1 489.7
	4th quarter	1 837.3
	FY 1958 Total	<u><u>\$5 718.4</u></u>

\*Actual

Plant and equipment balances at October 31, 1957 were:

<u>Plant and Equipment</u>	<u>Asset</u>	<u>Reserve</u>	<u>Net</u>
In Service	\$230 566 474	\$ 87 466 896	\$143 099 578
Held for Future Use	8 238 873	4 261 025	3 977 848

<u>Plant and Equipment</u>	<u>Asset</u>	<u>Reserve</u>	<u>Net</u>
Not Used Nor Currently Useful	\$ 74 537 570	\$ 74 537 570	\$ -0-
Total	<u>\$313 342 917</u>	<u>\$166 265 491</u>	<u>\$147 077 426</u>

November depreciation charged to product cost amounted to \$833 058 which is a decrease of \$69 683 from the amount charged in October. This amount includes assessments of \$88 506 from R & UO, \$9 064 from IPD and \$(7 797) from HIO. Depreciation expense charged to stand-by amounted to \$46 418 which is the same as was charged for October.

The reduction in depreciation charges to product cost of \$69 683 is the result of a fiscal year to date adjustment in the billing from HIO (\$26 564) and lower waste storage charges (\$43 119).

Activity relative to inventories of movable equipment was as follows:

Power and General Maintenance Shops Operation - Final report completed  
 Redox Administration, Processing, Radiation Monitoring, and  
 Maintenance Operations - Reconciliation completed; final report  
 nearing completion  
 Facilities Engineering Operation - Physical count completed;  
 reconciliation and final report in progress  
 Redox Waste Handling and Decontamination Operation - Physical count  
 completed; reconciliation and final report in progress.

#### D. Auditing

An audit report was issued covering the findings and recommendations in connection with the audit of General Books.

A memorandum was issued to Level 3 Managers summarizing irregularities in timekeeping practices noted during an audit of Payroll and Time-keeping.

Field work was started in connection with audits of the following activities: (1) Employee Benefit Plans, (2) Project Cost Accounting.

During the month 230 purchase requisitions were reviewed. It was necessary to withhold procurement action on one requisition for procurement of foul weather jackets, pending investigation of need by the originator.

#### E. Procedures

The procedural study for changing the Store Orders detail by Cost Code Report was completed during November. The changes have been programmed and will be reflected in the January reports. These changes will result in an annual clerical savings of 1 040 hours and annual supplies of \$520.

A procedural study of the Purex Operation's clerical function was initiated during November.

Agreement was obtained from Data Processing to issue a weekly Project Work Order Report. This will permit more timely and accurate reporting by the Project Accounting group.

F. Measurements

Cost and product analysis reports for Redox, Purex and Finished Product Operations, comparing actual costs and production with forecast, were prepared and issued to interested Level 3 Managers.

The Chemical Processing Department Measurement Report for CY 1957 was issued as scheduled.

III. ORGANIZATION AND PERSONNEL

A. Safety and Security

A safety and security meeting for all Financial Operation personnel was held on November 23, 1957.

No major or minor injuries were experienced during the month.

There were no security violations experienced during the month.

B. Reports Issued

HW-53505	Essential Materials Inventory and Consumption Report - October, 1957	S. R. Meyers
HW-53580	October Unit Cost Information - Redox	B. M. Dobbs
HW-53581	October Unit Cost Information - Purex	B. M. Dobbs
HW-53582	October Unit Cost Information - Finished Products	B. M. Dobbs
HW-53583	CPD Unit Cost Information	K. G. Grimm
HW-53588	Finished Products Cost and Production Analysis - October, 1957	G. H. Temple
HW-53589	Redox Cost and Production Analysis - October, 1957	G. H. Temple
HW-53590	Purex Cost and Production Analysis - October, 1957	G. H. Temple
Rough Draft	Product Cost Report	B. M. Dobbs
CLVI-129	CPD Cost and Production Performance - October, 1957	K. G. Grimm

  
MANAGER - FINANCE

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HW-53967

December 6, 1957

CHEMICAL PROCESSING DEPARTMENT  
FACILITIES ENGINEERING OPERATION

November, 1957

I. RESPONSIBILITY

There were no significant changes in responsibilities assigned to the Facilities Engineering Operation during the month.

II. ACHIEVEMENTS

PUREX OPERATION

A. Process Technology

1. Analysis of Purex Dissolver Operation

Data were recorded on a second Purex dissolver cut under carefully controlled conditions. This information will be used in further analyzing the Purex dissolver operation for the purpose of optimizing the integrated dissolver-backup facility operation according to the same technique used for the first dissolver cut analysis.

2. Purex Expansion Potential Beyond 3.2 Capacity Factor

An engineering study is underway to determine specific limitations to Purex capacity beyond a capacity factor of 3.2 under two-cycle flowsheet conditions. The purpose of this work is to gain familiarity with process equipment limitations and characteristics in order that the effects of varying flowsheet criteria and production requirements can be held in continual review. A survey of the Purex concentrator and concentrator condenser capacities has been completed indicating a minimum limiting capacity factor of 4.2. Capacities and capacity parameters of individual process equipment will be reported when determined and a summary report issued when the overall study is completed.

3. Prototype Plutonium Anion Exchange Unit

Process flow and engineering flow diagrams have been completed on the plutonium anion exchange prototype unit. These diagrams will be useful in following the initial operations of the prototype unit and in assessing the significance of any limitations apparent in

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the operations. Changes to these flow diagrams required as a result of prototype testing performed by Purex Technology will be incorporated as they develop.

**B. Plant Engineering**

**1. Concentrator Steam Trap Review**

The Purex facility has had continuing maintenance and operational difficulties with the steam traps on the five large concentrators. In order to obtain smooth operation of the concentrators, the bypass valve around the traps must be partially opened about 75 percent of the time. This procedure wastes steam and also pressurizes the steam condensate header.

Tests are being made for contributing factors to this condition. These tests include the installation of a thermal trap to relieve non-condensables, the installation of gauges to determine if the required pressure drop is present to cause the trap to function, and a rotometer installation in the air purge lines to determine if these are contributing to the non-condensable problem.

**2. "Donut" Jumper Maintenance**

The maintenance problem associated with the Purex dissolver off-gas "donut" jumper butterfly control valve was reviewed from the standpoint of process requirements and mechanical considerations. The process requirements were reviewed to determine whether the present parallel, two-valve control system is necessary and if the control valves are properly sized. From the mechanical standpoint an attempt was made to determine the specific cause or causes of valve malfunctioning with a review toward either improving the butterfly or replacing it with a more reliable type valve. The following conclusions resulted from this study:

- a. The present parallel, two-valve control system is necessary for good dissolver pressure control over the wide range of dissolver off-gas flow.
- b. The causes for valve failure are believed to be excessive corrosion of the internal valve parts, and the previous very limited use of the butterfly valve (resulting in corrosive "freezing" of the valve in the closed position).
- c. Recent changes in operating conditions have resulted in more continuous operation of the valve and less probability of condensate collection in the "donut" jumper.

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- d. The corrosion problem would be essentially eliminated by proper choice of material for the internal valve parts.
- e. Replacement of the butterfly valves with the more reliable plug type valves would require extensive modifications to the "donut" jumper and would be a more costly solution to the problem.

3. Purex Block Bails

A proposed method and procedure for the repair and upgrading the integrity of the Purex block bails has been submitted to the facility management and accepted as a basic concept. Details of work determination, formal estimates of cost, and final design are in process. Justification for the project will be based on failure of two (2) bails in operation, and the inherent weakness of the original design.

A piece of the broken bail from Purex canyon cover block G-3 was decontaminated and examined for metallurgical structure and possible defects. Examination indicates the steel to be AISI 1020, or a similar steel, either annealed or hot-worked and recrystallized. There were no apparent metallurgical defects, although the fracture face did not show the ductility usually expected. Additional metallurgical examinations are not planned. Proposed methods for repairing broken bails and reinforcing unbroken bails have been reviewed and recommendations regarding design and welding have been provided.

C. Project Activities\*

1. Purex L-Cell Package

The Purex L-cell package is complete according to the original drawings and estimate, except for final hydrostatic testing and visual inspection.

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 \* For complete information on projects, refer to the following reports:

General Managers Project Report  
 Semimonthly Status Report  
 AEC-HOO Monthly Progress Report of  
 Construction Jobs

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2. CA-513-E - Expansion of 200 Area Facilities

Directive AEC-64, Modification 5, dated November 8, 1957; and Work Authority CA-513-E(5), dated November 15, 1957, authorized the full scope of work, including capacity increase from capacity factor 2.75 to 3.2. Total funds in the amount of \$2,660,000 were authorized.

3. CG-647 - Dissolver Off-Gas Treatment Facility

Variable and significant leakage of dissolver off-gas through the 293-A stack by-pass valves may be an explanation for the observed non-reproducibility of previously obtained acid recovery values with changing operating conditions. The by-pass valves contain plugs which seat into the valve bodies along horizontal ledges. At a differential pressure across the by-pass valves of about 20 inches of water during cuts, deposits of ammonium nitrate in the valve seats could cause by-pass of significant amounts of oxides of nitrogen directly up the 291-A stack. The three 293-A valve headers were flushed with water after about two months of operation, to remove such deposits. Data are unavailable at present on the effectiveness of this flushing in minimizing gas by-pass.

Installation of the acid recycle line from the acid rundown tank to the top of the absorber was completed along with gas sampling lines upstream and downstream of the absorber and scrubber. The use of gas sampling techniques should permit improved measurement of acid recovery efficiency over previous liquid sampling. In addition, sampling of gas should provide an indication of possible leakage through off-gas valves.

4. CG-719 - Waste Tank Farm Vapor Disposal Facilities

Two alternate means of routing the waste tank recycle condensate from the condensate retention tank to the 202-A Building were developed. Alternate No. 1 utilizes one existing spare transfer line from F-cell to the 241-A-152 diversion box via the 241-A-151 diversion box. The total construction cost for this alternate was estimated to be \$13,000.

Alternate No. 2 recommended for adoption under the project provides for a new cross-country transfer line from the condensate retention tank to the 202-A Building. The total direct construction cost for alternate No. 2 was estimated to be \$35,000. This alternate, however, does not use the existing spare waste transfer lines from the 202-A Building to the 241-A-152 diversion box, retaining them for use in the cesium recovery program and/or possible future emergency requirements.

REDOX OPERATIONA. Research and DevelopmentGamma Absorptometer, LAFS Stream

A rough draft of a design information report for LAFS stream instrumentation has been prepared to clarify installation requirements which had been generally outlined in Process Design Report HW-51055. Present information continues to show that the two jet sampling system is the best in light of plugging problems experienced at Redox. Arrangements have been made with Process Control Development, HLO, to continue test work on the in-canyon degasser to study solution freezing conditions and degasser plugging using high specific gravity Redox type solutions. Development status to date does not indicate, however, that the in-canyon degasser is ready for this application.

It is planned to use a combined gamma absorptometer - pH flow cell, a two jet sampling system, and to replace the existing pH monitor shielded box with a new enlarged shielded box for the combined flow cell. The new box will allow room for possible future revision of the gamma absorptometer to use an Americium source instead of Thulium. Plans also call for addition of water vapor in the form of steam to the jet nitrogen in order to minimize plugging problems. Revisions as necessary to the scope drawings are being started.

B. Process Technology1. Failed Pipes

A new product, called Fluoroflex, is being considered as a replacement liner in the failed steam pipes. The vendor, Resistoflex Corporation, is forwarding technical data and samples of this product for examination. Arrangements have been made to obtain enough of the 2 inch diameter size to make tests in the East Area shop.

2. Steam Pipe Plugging Problem

Amine treatment of the steam still promises to be a possible solution to the steam pipe plugging problem at Redox. This particular problem was discussed with the Betz Laboratories representative at a meeting during the month. It is believed that amine treatment of the steam would remove the plugs existing in some of the Redox steam piping. The representative announced that the firm now has available a new type of amine which would be recommended for this use. The new type of amine has the ability to protect steam

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condensate piping and remove corrosion products, but is not supposed to remove it too fast during the initial usage of the material. It is expected that trap maintenance would increase by approximately 10 to 15 percent during the first three to six months of amine treatment. This extra trap maintenance would be caused by corrosion products removed from steam piping flushing through to the traps and catching there. After this period the lines would be unplugged and trap maintenance should be reduced to a minimum.

C. Plant Engineering

1. Evaluation of Redox Reorganization

An evaluation was completed of the combining of the Process Operation with the Product and Material Handling Operation in the Redox Plant. Information developed by the study indicates that the timing for the move was correct, and that significant savings had been effected. Some potential savings still remain.

2. Integrated Maintenance Management Program

The report "Integrated Maintenance Management Program at the Redox Plant" has been revised, and publication is expected during December. This report outlines the history of the formal maintenance program in Redox since its inception in 1955, and includes: (1) integration; (2) planning and scheduling; (3) preventive maintenance; and (4) maintenance measurements.

Achievements which have been realized from the program include: (1) reduction of nine people; (2) improved morale; (3) improved safety; (4) establishment of base measurements for evaluation of future improvements; (5) indoctrination of first-line supervisors in the principles and necessity for a maintenance improvement program. The report is sufficiently comprehensive as to provide the general framework for a program for any maintenance component.

D. Project Activities

1. CG-772 - E-Metal Dissolvers

Construction Engineering is proceeding with final design of the E-Metal dissolver vessel in accordance with the definitive process design. The structural complexity of the proposed E-Metal dissolver process design (and the flexibility of this complex equipment to stress failures from temperature differentials, impact loading, and vibration) has emphasized the importance of

the skill and judgment employed in final design and review. Present indications are:

- a. The known problems are being competently handled as they arise in final design.
- b. Suitable engineering talent is available at HAPO for every problem visualized or anticipated in the final design of the dissolver to date.
- c. It may be desirable, at a later date, to have an outside consultant review the completed vessel design. Ideally this review should be performed by an expert in the field of fabrication of heavy process equipment.

Further testing will be required to determine slug distribution, impact loading, and possibly vibration characteristics. These tests will be performed in the Hanford Laboratories as various design aspects become firm.

Recent production forecasts and thinking within Chemical Processing Department indicate that E-Metal dissolvers may not be required as early as originally thought. This may permit outside vendor fabrication for the first unit (s) and would permit the third party review of the design. A review of qualified design-fabrication firms was made to determine prospective vendors. This matter will be pursued further if and when outside fabrication definitely comes into the picture.

2. CG-648 - Off-Gas Treatment Facilities

During the past month, operating experience with the facility has shown a performance of 53 percent acid concentration and a 90 percent plus acid recovery. Work remaining to be done consists of completing a number of minor start-up changes and installation of the automatic acid control system. Completion of the latter item is dependent upon delivery of the instruments, which are promised for March, 1958.

FINISHED PRODUCTS OPERATION - Z PLANT

A. Process Technology

1. Hastelloy Applications

The uses of Hastelloy alloys for finished product applications were discussed recently during a visit with Haynes-Stellite Company

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engineering personnel. The Rotary Hopper Valve assembly recently fabricated onsite was the major item discussed. The choice of materials and fabricating methods to insure maximum corrosion resistance in hydrofluoric and hydrofluoric-nitric acid service at temperatures up to 200°C, and with minimum galling of rotating parts occurring, resulted in the following useful comments and recommendations:

- a. Hastelloy C is the most corrosion resistant Hastelloy material for hydrofluoric acid service. Haynes Alloy #25 is more corrosion resistant than the Hastelloy alloys in nitric-hydrofluoric acid service. Corrosion rates and test data are presently being developed by the Haynes-Stellite Company for these alloys and will be forwarded in the near future.
- b. Use of Stellite #6 hardfacing alloy on the Hastelloy C rotor appears to be a good choice for reducing the galling encountered on prototype valves. However, no published corrosion rates are available on hardfacing alloys.
- c. When using a Hastelloy C valve body, consideration should be given to having the rotor rough cold-pressed from Alloy #25 bar stock to develop desired hardness and then finish-machined. Hastelloy C and Alloy #25 are considered to be too nearly alike in structure to be used in combination without first hardening the #25 alloy. The expense and difficulty of making dies for this type operation may cause its use to be prohibitive.

## 2. Recuplex Neutron Monitoring

Experimental work is in progress in Recuplex to calibrate proposed neutron detectors for the D-11 tank with respect to Pu concentration and to determine the background effects and interference from Pu in other tanks. It is expected that gamma radiation interference can be successfully discriminated against.

A prototype neutron monitor is in operation on the H-S column. Although to date, it has only been roughly calibrated at the high end of the scale, the results are promising. A prototype pre-amplifier has been operating one and one-half months on continuous life and stability tests. The results have been satisfactory and the tests are continuing.

## 3. Exposure Dose Neutron Monitoring

The testing of the prototype design of the borated neutron monitor has been successful only in part. This design used two detector

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elements, one of which contained a boron film. After calibrating the device using the Van DeGraff Accelerator in the 300 Area, it was evident that the monitor in its present form could not detect the energy level of an incident neutron. However, if the energy level can be separately determined, the monitoring device can give a reading in mrem, which is the desired quantity in Task I. Also, assuming that the energy level of the neutron flux (average) will remain fairly constant, then it is possible to design a device for permanent installation which will give a continuous reading in mrem of the neutron flux present.

#### 4. Shielding Studies for Project CG-734

Measurements for neutron and gamma made on existing process hoods in the 234-5 Building show that shielding for both neutron and gamma radiation will be a major problem on the process hoods of the RMC Button Line. It is now evident that neutron radiation contributes a majority of the exposure associated with the Task II and III Processes. The quantity of shielding required to reduce the radiation levels sufficiently to eliminate dilution of manpower to avoid overexposure would require an appreciable increase in construction costs and in many cases would interfere with the operability of the process. Alternate bases of shielding are being developed in an attempt to arrive at a reasonable compromise between project cost and permissible radiation exposure.

#### B. Plant Engineering

##### Semi-Automatic Process Sump Operation

Engineering has been completed for a design to allow semi-automatic operation of the 241-Z process sump area which will automatically control the pumps pumping water from the retention basin to the disposal canal. In the sump area the design provides for the following:

- a. Automatically jetting contents of tank D-6 and tank D-7 when D-6 is filled, ringing an annunciator in the 234-5 Building when this operation is complete.
- b. Automatically starting and stopping the agitators in D-6 tank, providing protection against the agitator ruining itself by running when the liquid level is too low.
- c. Ringing of the annunciator in 234-5 Building when the D-6 tank reaches 2/3 full the second time if the operator has not neutralized and jetted out the contents of the D-7 tank.

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- d. Automatically cutting off the D-7 jet and D-7 agitator at the proper times so that the operator does not have to stay there until the jetting is complete.
- e. Ringing of an alarm in 234-5 Building in the event any one of tanks D-4, D-5 or D-6 overflows.

C. Project Activities

1. CG-691 - Continuous Task I and Task II

Improvements are being made on continuous Task I and Task II equipment. The progress and status at the end of the month on some of the more important improvement items are described briefly below:

- a. All design work associated with the procurement and installation of a new five liter reactor vessel in hood 9A and 9B has been completed. Also, a new Thy-Mo-Trol drive unit has been provided to drive the reactor agitator.
- b. The design for a new rotary drum filter pan and agitator was completed and one of these assemblies was fabricated in the shops and delivered to the 234-5 Building for installation. This design was developed to eliminate the packing gland which has been a serious source of trouble on the existing filter agitator.
- c. Designs for modifications to the Poro-Carbon filter have been completed and the parts are being fabricated in the shop. These changes were made to spring load the filter in place in order to make its replacement easier and to obtain a better seal.

The principal design work that remains to be performed is the evaluation of possible changes to some of the instrument control systems.

2. CG-745 - RMC Fabrication Line

Project proposal, revision 1, requesting total project funds, was transmitted to HOO-AEC on May 17. A directive authorizing \$60,000 additional design funds was received by the General Electric Company on November 8, 1957. A directive authorizing total project funds of \$1,000,000 was received by the General Electric Company on November 25.

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FINISHED PRODUCTS OPERATION - UO<sub>3</sub> PLANT

A. Process Technology

Continuous Calciners

Last months report of examinations of failed agitators from the continuous calciner should be modified to show that additional examination revealed that fatigue cracks were not found on cast parts. Only samples of wrought steel revealed fatigue cracks. Lack of fatigue cracks on the cast pieces is more plausible, inasmuch as failure by fatigue was not detected on any castings in service.

B. Project Activities

CG-770 - Feed System and Powder Pick-Up Modifications

The new UNH feed filter system is now ready for use. All work is completed except for some insulation and instrumentation work. Mock-up of the first feed box panel assembly has been completed and is scheduled for installation in the 224-UA Building early in December during the scheduled shutdown. The minor modifications made to the existing pick-up bins have significantly improved their performance. Consequently, the planned replacement of the pick-up bins with a new design will not be done.

GENERAL ACTIVITIES

A. Research and Development

1. Krypton-85 Recovery

A review of both the classified and unclassified literature on the recovery of krypton from gas mixtures is in progress. The bulk of the classified information on Krypton-85 processing is found in ORNL and IDO documents on the (Radioactive Gas Separation) process, which was developed on a pilot plant scale at Oak Ridge and subsequently tested on a somewhat larger scale at ARCO.

Exploratory studies were made on the applicability of the silica gel adsorption step for krypton recovery, as embodied in the RAGS process, to the problem of krypton recovery from Purex dissolver off-gas. The relationships developed at ORNL predicting silica gel performance, when applied to Purex off-gas condition, would indicate that large quantities of silica gel would be required even for adsorption cycles as low as 24 hours for 95 percent krypton breakthrough from the first silica gel bed. Inasmuch as the ORNL

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equations consider inlet krypton concentrations of about 2,000 ppm, these equations may not be applicable to Purex conditions where the inlet concentration would be less than 5 ppm. Further review of the ORNL data is in progress.

## 2. Power Reactor Fuels Reprocessing

Preliminary investigative engineering work has continued in anticipation of assignment of reprocessing of low enrichment power reactor fuels to Chemical Processing Department. Significant developments in the field of power fuels reprocessing during the past month include:

- a. Hanford Laboratories has initiated a study considering various combinations of known processes and installations aimed at ultimately obtaining the most economical facilities in meeting the interim processing requirements. A payoff period of two years is being used in determining the optimum balance between capital and operating funds.
- b. Recent reports from designers and prospective operators of new reactors now being considered indicate that the low enrichment range may be extended above 3 percent U235. Any trend in this direction would, of course, significantly affect the reprocessing picture at HAPO. There has been no confirmation of this point from the AEC.
- c. The fuel element design for the Hanford 58-b-8 production reactor is not firm as yet. Present indications are that the cluster fuel element of metallic uranium rods clad in zirconium with an overall length of about five feet will be selected however, although none of the other possibilities have been eliminated yet according to available information. The uranium core zirconium jacketed cluster element fits quite well into the power fuels reprocessing program from the separations viewpoint.
- d. A review of the criteria for examination of Plutonium Recycle Test Reactor fuel elements after irradiation indicates requirements beyond any mechanical facility conceived currently for the power fuels reprocessing.

## B. Plant Engineering

### Maintenance Management

Work continued on developing a program for more effective maintenance

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management of custodian properties in 200-E and 200-W. The revised program of service orders and work orders has been in operation since November 1, with good results. Although it is too early to draw quantitative conclusions, indications are that the new system has reduced landlord maintenance costs significantly.

The card file has been completed for the landlord preventive maintenance file, and plans are being made to schedule as much of the work as is economically sound. The development of engineered estimates for routine maintenance activities, is well underway. This appears to be the first formal application of this technique at HAPO.

C. Project Activities

Financial

Project Cost information as of November 17, 1957:

Total Authorized Funds - Active Projects	\$13,671,000
Total Cost-to-Date	9,491,000
Commitments and Open Work Releases	1,076,000
Unencumbered Balance	3,104,000
Costs Charged to Above Projects from October 20, 1957 to November 17, 1957	333,000

Projects dropped from active status during 4 weeks ending November 17, 1957 are:

<u>Project No.</u>	<u>Authorized Funds</u>	<u>Total Cost</u>
CG-647	\$1,150,000	\$872,748
CG-712	58,000	50,979

III. ORGANIZATION AND PERSONNEL

A. Personnel

Effective November 1, 1957, H. Radow was transferred to Project Engineering, Hanford Laboratories Operation. Effective November 5, 1957, W. C. Armstrong was placed on a loan assignment to Construction Engineering Operation for a tentative period of four to six months.

During the month of November the following classifications of non-exempt personnel were transferred: Stenotypist to Hanford Laboratories Operation, Secretary to Purex Operation, Clerk to Finished Products Operation and Stenotypist to Power and General Maintenance.

B. Safety

There were no significant changes in safety performance during the month of November.

C. Inventions

None

D. Reports Issued

- HW-53366 Definitive Scope of a Facility for E-Metal Product Segregation at the UO<sub>3</sub> Plant, Project CG-767, by L. D. Gustafson, November 4, 1957.
- HW-53440 Development of a Valve for the Control of Streams of Powdered or Granular Solids, by J. M. Gerhart, November 1, 1957.
- HW-52947 Scope Design - Cesium Recovery Plant, Part I - Wet Chemistry, by J. M. Gerhart and H. G. Johnson, October 31, 1957.
- HW-52039 Project Proposal, Revision 2, Transfer Facilities for Redox Non-Boiling Wastes (Project CG-717), by R. H. Silletto, September 25, 1957.
- HW-52862 Project Proposal, Revision 2, Utilization of 224-U Acid at Redox and Purex (Project CG-722), by D. A. Snyder, October 2, 1957.
- HW-52950 Project Proposal, Additional Fire Protection, 222-S (Project CA-783), by R. H. Silletto, October 9, 1957.
- HW-53394 Assumptions for Preparation of FY 1960 Plant Acquisition and Construction Budget, by D. R. Gustafson, November 7, 1957.
- HW-53566 Program of Capital and Expense Improvements for the UO<sub>3</sub> Plant, by H. P. Shaw, November 11, 1957.
- HW-53602 Bases for FY 1960 Budget Assumptions, November 12, 1957.
- Letter H. P. Shaw to H. H. Schipper, Supplemental Information, Project CG-734, November 22, 1957.

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E. Trips

G. A. Conner attended the World Metallurgical Congress, November 4-7 at Chicago; visited Haynes Stellite Co., Kokomo, Indiana, November 8; and Michiana Products Co., Michigan City, Indiana, on November 11, 1957.

P. S. Kingsley attended the World Metallurgical Congress, November 4-8 at Chicago; he also visited Chicago Hose Co. and the Argonne National Laboratory.

J. M. Gerhart visited Argonne National Laboratory and the Mallinckrodt UO<sub>3</sub> Plant at St. Louis to study the fluid bed calcination process for possible application to power fuels handling.

F. H. Waldrep attended a Welding Clinic sponsored by Alcoa in Seattle, Washington, on November 15, 1957.

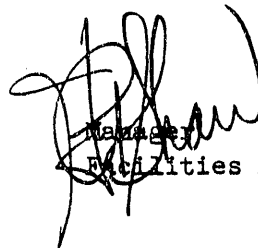
F. Visitors

Mr. Robert Swan, Sales Engineer of Resistoflex Corporation, visited HAPO 11-18-57 to discuss the suitability of Fluoroflex as a replacement liner in the failed Redox pipes.

Mr. F. P. Robinson of the General Electric Company Apparatus Sales Division, Pasco office, visited the Plant 11-18-57, for the purpose of inspecting equipment.

Mr. Robert Carlson and K. Kettinger of the Arther-Forsyth Company, representing Armstrong Traps, visited the Purex Plant November 26, 1957, to discuss the steam trap failures.

Frank Boone, Project Engineer, U.S. Pumps, Inc., was a visitor on November 19, 1957. After a discussion of current pumping problems, he was shown through the 200-E and 200-W shops to better acquaint him with some of our problems.



Manager  
Facilities Engineering Operation

HP Shaw:FC:mh

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CHEMICAL PROCESSING DEPARTMENT  
RESEARCH AND ENGINEERING OPERATION

NOVEMBER, 1957

Classification Cancelled (Change

By Authority of 66-112-179

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By 66-112-179

PUREX PROCESS TECHNOLOGY

Feed Preparation

Irradiated uranium with exposure rates of 4.3 to 6.5 MW/T (295 to 617 MW/D/T) and "cooling" times of 80 to 117 days was dissolved and prepared as solvent extraction feed during the month. Two acid-deficient dissolver batches, which had been set aside to prevent high solvent extraction plutonium losses, were acidified to 1 M HNO<sub>3</sub> and heated to dissolve plutonium polymer. One batch was refluxed for 42 hours and the second held at 60-80°C for four days prior to processing.

Mercuric nitrate (5 x 10<sup>-4</sup> M), added to the HAF for suppression of iodine from the vessel vent system, reduced the stack discharge from 1.0-1.2 to 0.2-0.3 curies per day. This low emission rate was achieved with the aid of the Backup Facility despite routine dissolution and processing of 88-90 day "cooled" material.

Prior to definitely pin-pointing the iodine release as coming from the vessel vent system, the lower bed of the C Cell prototype, dual-pass reactor was given a "one-shot" regeneration. Later this regeneration proved to have been unnecessary, although the reactor had processed off gases from 1564 tons of uranium, more than four times the amount usually processed by a conventional Purex silver reactor before a breakthrough.

Solvent Extraction

Typical performance of the solvent extraction cycles which operated 87 per cent of the month is tabulated below:

Cycle	Log Gamma Decontamination Factor, dF		Instantaneous Waste Loss, Per Cent	
	Uranium	Plutonium	Uranium	Plutonium
Precycle	2.7(a)	2.7(a)	(b)	0.18
Partition	1.8	1.9	(b)	0.17 (ISU = 0.07)
Final	3.0	3.0	0.004	0.03
Overall	7.5	7.6	--	0.38

- (a) Based on a calculated value of 2.5 x 10<sup>8</sup> uc/gal for HAF.
- (b) No uranium analysis.

Although the plant production rate was changed several times during the month, decontamination performance was excellent with only small bursts of gamma

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activity occurring in the intercycle streams. Neither rework of IWW nor acidified ICW had any detectable effect on the solvent extraction decontamination performance. Several batches of above-gamma-specification uranium were produced when the 2D Column interface probe shifted calibration, and a rise of the interface into the column bore resulted. All of the off-standard material was blended with other uranium product to meet specifications.

Solvent extraction waste losses during the month were generally excellent. Temporary high HAW and HCW plutonium losses (up to 0.5 and 1.0 per cent, respectively) resulted from the reprocessing of acidified ICW. Neither adjustment of the HC Column pulse frequency nor increasing the L/V from 1.4 to 1.6 had any detectable effect in reducing the HCW losses. Comparatively high HAW plutonium losses (up to 0.25 per cent) were encountered on two different occasions: (a) when processing the acid-deficient feed batch which was held at 60-80°C for four days, and (b) when L Cell recycle was reprocessed without addition of sodium nitrite to the feed. The IAW waste losses were reduced by one-third when the IAF temperature was increased to 60°C.

When the overall plant production rate was increased to  $CF = 2.34$ , the IBX and IBS flows were maintained at  $CF = 1.92$  in order to assure stable operation of the 2A Column interface controller which operates poorly at rates above  $CF = 1.92$ . No significant change in the partitioning performance of the IBX Column resulted from the reduced IBX flow. Operation of the IC Column was unstable above  $CF = 1.92$  despite pulse frequency adjustments until the ICX temperature was increased from 50° to 55°C and the L/V was reduced from 1.1 to 1.0.

Other solvent extraction items of interest which occurred during the month were:

- a) The  $Fe^{++}$  concentration in the 2DF was reduced to flowsheet (0.014 M) from 130 per cent of flowsheet without significantly increasing the amount of plutonium in the uranium product.
- b) A flush of the 2B Column after shutdown proved conclusively that increasing the 2EX nitric acid concentration from 0.01 to 0.15 M completely eliminated the buildup of plutonium polymer within the column.
- c) Routine operation of the Final Uranium Cycle at  $CF = 3.19$  permitted successful rework of 130 tons of off-standard uranium product (high plutonium content) concurrently with normal production processing.
- d) During the plant shutdown the HA, HC, 2A and 2B Columns were flushed, and the HA Column was replaced with the new organic-continuous column designed for two-cycle operation.

Plutonium Concentration

Test operation of the prototype plutonium anion exchange equipment continued throughout the month. The major unsolved problem encountered to date has been the adverse effect of the XA Column solution rates on the satisfactory

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movement of the resin within the column, a condition not encountered in developmental work. Final tie-in of the prototype with the Purex plant equipment was accomplished during the November shutdown, but the facility has been blanked-off from "hot" solutions until the above problem is resolved.

Solvent Treatment

Batch washing of the No. 1 Solvent System organic with alkaline permanganate ( $1.5 \times 10^{-4}$  lb.  $KMnO_4$ /lb. solvent in 2.5 per cent  $Na_2CO_3$ ) followed by a sodium carbonate contact (2.5 per cent) in the IO Column provided high quality solvent throughout the month. A nozzle restriction on the G Cell centrifuges (overflow line from the IO Column) appears to limit the plant capacity to  $CF = 2.4$  on a three-cycle flowsheet, but conversion to the two-cycle process will approximately double this capacity factor. Although the 20 Column interface probe responded poorly periodically, the solvent cleanup by the column was not affected.

Waste Treatment and Acid Recovery

Solvent extraction wastes were processed satisfactorily in the Waste Treatment and Acid Recovery sections of the plant during the month. Waste volumes sent to Tank 241-A-101 averaged 171, 283, 12 and 120 gallons per ton of uranium processed for neutralized IWW, solvent washes, centrifuge cleanouts and cell drainage, respectively. Coating waste volumes of 232 gallons per ton of uranium were transferred to the 241-C Tank Farm. A new low overall plutonium waste loss of 0.50 per cent was established during the month with a uranium loss of 0.15 per cent occurring. Coating waste losses for plutonium and uranium amounted to 8 and 23 per cent, respectively, of the overall losses. Approximately 575 units of plutonium and 160 pounds of uranium were recovered by rework of IWW and ICW solutions. The latter solution was acidified and treated with sodium nitrite to dissolve  $MnO_2$  prior to blending with HAF.

When the IWF valve failed, a plant shutdown was averted by judiciously bypassing the No. 1 Concentrator and routing the IWF, after neutralization, into the self concentrating underground storage tank until a spare jumper was installed.

Self-concentration in Tanks 241-A-101 and 103 continued at boil-off rates of 8.9 and 6.3 gallons per minute, respectively. Tank 241-A-101 currently contains 45 per cent of the terminal 10 M  $Na^+$  at the hydrostatic head limit.

An inadvertent ten inch reduction in the liquid level of Tank 241-A-103 increased the sludge temperature from 117 to 131°C. Replacement of the liquid by water addition dropped the temperature back to normal.

REDOX TECHNOLOGY OPERATIONFeed Preparation

The dissolvers were in operation 80 percent of the month, processing irradiated uranium having exposures ranging from 454 to 601 MWD/T at power levels of 4.6 to 6.5 MW/T. An iodine-131 emission to the stack of 14.1 curies, concurrent with extensive solvent spraying of the canyon crane, resulted from passage of the chlorinated hydrocarbon vapors through the sand filter and its associated ventilation system. Exclusive of this peak, the emission of iodine-131 to the stack averaged 0.10 curie per day of dissolver operation with metal cooling periods of 87 to 115 days. The apparent combined efficiency of the silver reactors and caustic scrubber, for the period of dissolver operation, was 99.95 percent despite a decrease in the average cooling period from 107 to 99 days.

Continued testing of the Acid Recovery and Iodine Removal facilities, in processing off-gas from both up-draft and down-draft dissolvers, indicated generally satisfactory performance with the recovered acid concentration averaging about 54 percent. Despite unsatisfactory balancing of the oxygen and specific gravity controllers, the acid recovery averaged about 80 percent of that theoretically available, affording a saving in nitric acid costs of \$40 per ton of uranium dissolved. The data on iodine-131 input to the absorber system were insufficient to permit estimation of the iodine removal efficiency.

Concentrated waste volumes of 300 to 400 gallons per feed batch were used for the permanganate reduction step in approximately 60 percent of the feed batches prepared during the month. About 30 percent of the feed batches contained additional waste as rework, with volumes ranging from 300 to 1300 gallons per batch. The primary sources of the waste requiring rework were (1) sump wastes containing leakage from the H-4 oxidizer, (2) acid flushes of the columns and associated tanks and (3) salt wastes containing higher-than-normal product values.

Solvent Extraction

The solvent extraction system was operated at rates ranging from 72 to 120 percent of Phase II with a major interruption for replacement of the failed H-4 oxidizer. Extraction performance during the report period was characterized by excellent plutonium decontamination and very poor decontamination of uranium.

Only 4 percent of the 2EU met the specification for fission product activity, and approximately 80 percent of the throughput required treatment in both the ozonation and silica gel facilities before meeting specifications. Since the major contaminants were zirconium and niobium, ozonation gave an average arithmetic decontamination factor of only 1.4, while an average DF of 5.5 was obtained in the silica gel facility. Inadequate HAF clarification continues to be the cause of the poor uranium decontamination despite an increase in frequency of cake removal to an average of once every sixth batch. Washing of

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the centrifuge cake, without the benefit of a skimmer or tachometer, resulted in recycling 85 percent of the cake activity, thus rendering the centrifuge virtually ineffective.

An additional consequence of the inadequate feed clarification was the appearance of emulsification or flooding in the 1A Column at flow rates equivalent to 80 percent of the normal flooding rate. A definite similarity between the emulsification in the 1A Column and that previously encountered only in the HA and HS Columns was the successively lower flow rates at which emulsification occurred. Within a 24-hour period the point of emulsification had progressed from 80 to 74 percent of flooding.

Flushing of the HA, HS and 1A Columns with 10 percent nitric acid recovered only a small amount of plutonium, indicating that the extractant flows, at a 400 flow ratio, were sufficient to prevent plutonium deposition.

#### Product Recovery

The over-all product recoveries for uranium and plutonium averaged 99.82 and 99.21 percent, respectively. The abnormally high plutonium losses were not traceable to the extraction system since the losses from this source averaged less than 0.25 percent. One major source of the losses appeared to be gassing of the 3BP receiver tank jet following solution transfer to the 3BP sample tank. After elimination of gassing on this transfer the salt waste losses were reduced by a factor of two, to less than 0.4%. The cause of the remaining discrepancy between extraction and total waste losses has not been ascertained.

The HAW and HSW losses encountered during the preceding month were reduced significantly following acid flushing of the HA and HS feed tanks. This reduction in losses, coupled with the apparent recovery of approximately 600 units of plutonium in these flushes, appeared to confirm the deposition of plutonium polymer in these tanks during the September flushing. Since the dissolved plutonium polymer was routed through the waste system to the waste rework tank, it is possible that a portion of the recovered plutonium may have re-deposited in the waste system and be contributing to the current unexplained waste losses.

#### Waste Storage

The neutralized waste volume averaged 1080 gallons per ton, exceeding the flowsheet value by approximately 17 percent. The coating waste volume averaged 130 gallons per ton of uranium dissolved.

The program for evaluating control of pressure and sludge temperatures in the 107-SX tank is awaiting installation of a high speed pressure recorder, needed for determining the effect of impact on tank loading.

FINISHED PRODUCTS TECHNOLOGY OPERATIONURANIUM CONVERSION OPERATIONProcess Performance

Four carloads failed to meet particle size specifications. The analyses ranged from 95% to 97% through 40 mesh compared to the specification of 98%.

At the request of the customer, one carload of  $UO_2$  was produced which contained a nominal 300 - 400 parts sulfur per million parts uranium. The carload averaged 492 ppm U and the containers ranged from 187 to 708 ppm U.

Nine hundred forty-eight pounds of nitric acid per ton of uranium processed (90% of theoretical) were recovered. The average acid concentration was 48.5%.

Continuous Calciners

The shear pin protected agitator was installed in a second calciner during the month. Agitator damage was sustained in three calciners. One failure involved the original cast paddle assemblies while the other two involved sheared pins on the modified assemblies. In one case, the new agitator failed due to a broken feed point; in the other, a stronger shear pin may be indicated. Damage was nominal in both cases.

During the month six feed injector pipe failures occurred. One of these failures involved an assembly modified with an expansion joint. A feed injector assembly with increased strength has been installed in one calciner.

The wet separators were in operation in all cells. Satisfactory acid drainage was experienced following modification of the acid cooler to provide two instead of ten passes for the off-gas.

METAL FINISHING OPERATIONTask I and II

The continuous facility processed a total of 400 runs with an average of 2% of the feed recycled in supernates during steady state conditions. Eight low density buttons were produced as a result of intermittent periods of operation with inadequate oxalate cake filtration. All other buttons produced had acceptable densities.

Recuplex

Forty-one runs, consisting of crucibles, fragments, powders, and clean-outs, were processed through the SC Hood. Slurry losses to crib averaged 0.58% of the recovered Pu. Dissolution conditions for the crucibles and powders were at an F/Al mol ratio of 3.5/1. No increase in dissolver corrosion rate has been noted when compared to dissolution at an F/Al ratio of 3/1.

Testing of the ten-crucible dissolver flowsheet has been completed. Operating conditions and results are compared with the eight-crucible flowsheet in the table below.

	<u>8-Crucible</u>	<u>10-Crucible</u>
Average number of crucibles processed/month	334	333
Al/F mol ratio during coagulation	3.5/1	2.5/1
Average number of SC runs/mo.	45	37
Volume of feed per crucible	49 L	45 L
Dissolver cleanouts/100 SC runs	7.5	10
Percent solids in feed after filtration	0.08	0.19
SE operating efficiency	63%	64%
Instantaneous feed rate to columns	1950 L/Day	1790 L/Day
Extraction waste loss (avg.)	0.0045 g/L	0.01 g/L

It is apparent that the ten-crucible flowsheet offered no operating advantages, since the increased solids in the feed resulted in decreased solvent extraction capacity and higher waste losses.

The SE columns processed 1220 liters per day of feed at an operating efficiency of 65% for an instantaneous rate of 1880 liters per day. Waste losses averaged 0.0070 g/L, or 0.91% of the Pu processed to the columns.

PROCESS CHEMISTRY OPERATIONPROCESS ASSISTANCEGeneral Process Studies

Further laboratory studies have been made of the effect which Permacol (a water emulsion of octadecylamine and octadecylamine acetate) in process streams might exert upon the separations processes. The results indicate that traces of Permacol (up to five parts per million parts uranium) will not be detrimental. In this work, it was found that 1) the wetting characteristics of stainless steel were not affected by contact with Redox process solutions containing Permacol; 2) as much as five parts Permacol per million parts uranium did not cause foaming during the calcination of uranyl nitrate, and did not affect the reactivity ratio of the resultant  $UO_2$ ; and 3) neither the appearance nor characteristics of Permacol were altered by irradiation with a cobalt-60 source to exposure levels as high as  $9.2 \times 10^6$  roentgens.

Purex Process Studies

High plutonium losses to the HCW stream were experienced in the Purex plant during the processing of some acidified carbonate (solvent-washing) waste. Examination of a large sample of the waste revealed the presence of about one volume per cent of a heavy organic phase, which was presumed to be loaded with dibutyl phosphate and hence the cause of the losses.

A laboratory study of the use of hydrazine as a partitioning agent in the Purex process has been initiated. In tests of the chemical stability of hydrazine, the reducing normality of a solution containing 0.05 M hydrazine and 0.6 M  $HNO_3$  was found to be unchanged after a one week exposure to any of the following conditions: 1) boiling; 2) air sparging at room temperature; or 3) continued contact with 30 per cent TBP in Shell E-2342. Studies of the rate of formation of plutonium(III), in a solution initially containing 2 g/l plutonium(IV), 0.5 M  $HNO_3$ , and 0.11 M hydrazine, have shown the reduction rate to be significantly temperature-dependent. For example, 90 per cent reduction was achieved after two hours at 35 C and after only 20 minutes at 60 C. Distribution ratios for extraction of the plutonium into 30 per cent TBP in E-2342, after reduction with hydrazine, were comparable to the ratios measured for plutonium reduced with ferrous sulfamate.

ANALYTICAL ASSISTANCEAlpha Scintillation Counting

Efforts to adapt alpha scintillation counters (ASC) to 200 Area Control Laboratory counting needs were continued. As previous studies demonstrated that the ASC tested was comparable in performance to present Control Laboratory gas flow proportional counters (ASP), two new ASC chassis were fabricated to determine any variation between several scintillation counters. Incorporated in the new chassis are the following innovations designed to reduce

maintenance costs and improve counting accuracy:

1. Removable and interchangeable pedestal caps, to facilitate the cleaning or replacement of contaminated pedestal caps.
2. An adjustable pedestal to provide a means of adjusting a group of scintillation counters to the same geometry, with a position lock to fix the source position after adjustment.
3. The combining of the pedestal and geometry disc into a single permanent unit to eliminate the handling of geometry standards.

Other work is directed at using to advantage the very short resolving time (0.2 micro seconds) of the alpha scintillation phosphors, to measure high level alpha sources (100,000 - 1,000,000 c/m). Current efforts in this endeavor are aimed at indirectly measuring the total light produced in the crystal by alpha particles by measuring the total current produced by the photomultiplier tube.

#### QUALITY CONTROL AND STANDARDS

During the month the Quality Control program for the Chemical Processing Department analytical laboratories was maintained as usual, and the Standards Laboratory continued the production of calibrated glassware and standard solutions. The calibration and checking of geometry discs for the alpha counters was in good control at month end.

234-5 DEVELOPMENT OPERATIONTask I - Continuous Evaporative Kill

Two evaporative kill runs were made, using supernatants from the prototype precipitator-filter. The effect of solids and of manganous ion concentration was studied.

For the first run the plutonium concentration in the feed was unusually high; resulting in precipitation of a large fraction of the plutonium. Thus, the experimental conditions were not clearly defined. The apparent oxalate decomposition half-time in the evaporator was around 30 minutes at a bottoms concentration of 5.9 g/l Pu, which is somewhat longer than would be predicted (20 minutes) from available data. Final oxalate concentration was 0.014 molar, down from an original 0.15 molar. Solids were observed in the evaporator bottoms throughout the run and these would, of course, tend to decrease the decomposition rate.

The feed for the second run was spiked with manganous ion and contained only a small amount of solids. However, considerable solids remained in the evaporator from the previous run. The oxalate concentration in the bottoms decreased as the run progressed, and the last sample, taken after about 2-1/2 throughputs, showed an apparent decomposition half-time of 21 minutes. The manganous concentration in the bottoms was around 0.05 molar at this time, which should have produced more rapid decomposition than that obtained. The solids undoubtedly again retarded the reaction and had we been able to run longer, the oxalate concentration would have probably decreased further. Final concentration was 0.011 molar, off from a feed concentration 0.19 molar.

From the evaporator prototype tests it is apparent that a small amount of solids, such as is usually found in Task I supernatants, can be tolerated in the evaporative kill process. However, large amounts of solid oxalate will inhibit the decomposition markedly.

Permanent Mold Casting

Two more pours were made before the casting program was discontinued. All metal surfaces have been satisfactory on pieces cast through the tantalum diverter with pouring temperatures regulated to the optimum values. Two castings were rejected because of incompletely-formed pieces due to overflowing of the tantalum diverter and loss of the metal. A new and larger tantalum diverter is being constructed.

Skull Recovery

Recovery of plutonium metal from skulls by vacuum melting is impractical when the skull fragments are less than 1/8" thick or are badly oxidized. Several attempts to remelt such skulls resulted in only 10 - 15 percent recovery. A vapor phase reduction drawing sublimed calcium through the skulls was also unsuccessful.

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Research and Engineering

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Experiments are now under way melting skulls in a calcium chloride-calcium fluoride eutectic mixture with an excess of calcium present. Chalk River has reported complete reduction of plutonium dioxide by this method (PR-CM-10a). Although calcium fluoride crucibles were previously believed satisfactory, experiments resulted in complete dissolution of these crucibles by the melt.

In magnesia crucibles, the calcium chloride is absorbed by the crucible as fast as it melts before the eutectic forms. Further tests are under way to obtain a satisfactory crucible.

#### Ceramic Development

As noted last month, LS-105 tensile specimen molds were fabricated of Glascast, a proprietary borosilicate glass powder produced by the Corning Glass Works for making precision molds. Such molds are now being made at the request of the Plutonium Metallurgy Operation. Plutonium metal tensile specimens cast in these molds are reported by Plutonium Metallurgy to be unusually fine-grained and to have nearly twice the tensile strength of metal cast in graphite. An acceptable boron concentration of approximately 4 ppm was found in the outer shell of metal where the maximum opportunity for boron pickup exists. Silicon was about 200 ppm, decreasing toward the center. On the basis of these results, Glascast offers considerable promise for use in plutonium casting.

INVENTIONS

All Research and Engineering Operation personnel 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 November, 1957. 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.

InventorTitle

None

BUSINESS TRIPS AND VISITORS

A. M. Platt of the Advance Process Development Operation visited the General Electric Company, Atomic Power Equipment Department, San Jose, California on November 7 and 8, 1957 for technical consultation with R. B. Richards.

A. M. Platt visited F. L. Culler and E. L. Anderson of the Oak Ridge National Laboratory, Oak Ridge, Tennessee on November 18 and 19, 1957 to attend a conference on power reactor fuel reprocessing technology.

B. F. Judson of the Advance Process Development Operation presented a talk at the Governor's Annual Conference on Safety at Olympia, Washington on November 21, 1957.

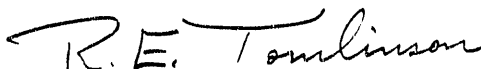
M. N. Raile of the Finished Products Technology Operation visited the General Engineering Laboratory, Schenectady, New York on November 12 thru 14, 1957 to attend the Symposium on Vacuum and Hermetic Systems.

M. N. Raile visited John A. F. Trueman, William B. White, Frank Mourich (G.E. liaison man for Purchasing) of the High Vacuum Equipment Corp., Hingham, Mass. on November 15, 1957 to review progress on construction of prototype vacuum melting furnace.

J. M. Fletcher of AERE, Harwell, England visited V. R. Cooper, R. E. Tomlinson and A. M. Platt on November 5, 1957 to hold technical discussions.

R. E. Fearnon and H. Watanabe of the Phillips Petroleum Co., Idaho Falls visited Ward Swift on November 15, 1957 to tour Purex Plant.

J. J. Fabo and J. M. Strong of the General Electric Company, ANP, Idaho Falls, Idaho visited H. M. Jones on November 22, 1957 to discuss iodine monitors.



Acting Manager, Research and Engineering  
CHEMICAL PROCESSING DEPARTMENT

RE Tomlinson:jap





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EMPLOYEE RELATIONS OPERATION  
MONTHLY REPORT NOVEMBER 1957

I. RESPONSIBILITY

There were no changes in responsibility during the month of November.

II. ACHIEVEMENT

FIRE PROTECTION OPERATION

A. Fire Responses

1. A response was made to an automotive fire in the engine of a truck located  $\frac{1}{4}$  mile east of 200-W Area on November 15. This was caused by a loose exhaust pipe and was extinguished by driver. CPD Power and General Maintenance. Loss Nil.
2. A response was made on November 24 at 6:06 PM to 272-E Building, 200-E, CPD Power and General Maintenance. This was a false alarm and the cause was not definitely determined.
3. A response was made on November 26 to 200 W Area. Upon arrival the firemen found a smoldering fire existing in insulation of duct work between buildings 233-S and 202-S. The cause might have been due to hot slag from welding that had been done. Construction Engineering Operation, 200 Area Field Construction Operation. Loss \$25.

B. Fire Extinguisher Service at 200-East, 200-West, Concrete Batch Plant, BY Telephone Exchange, and Yakima Barricade.

During the month 295 fire extinguishers were inspected, 5 installed, 3 delivered, 10 seals broken and not reported, 27 serviced and 220 weighed.

There were 26 gas masks inspected and five serviced. Twenty hand lines were inspected.

C. Training of Personnel in Other Operations

Ten bus drivers received training in evacuation procedure and driving.

D. Services Performed for Other Operations

1. During the month 59 man hours were used in flushing contamination from area roads. Wetter water proved very effective in this work.
2. Fire Protection Operation personnel stood by with T-2 while welding was being done on flat car, which was covered with paper due to radiation.

[REDACTED]

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DECLASSIFIEDEMPLOYEE COMPENSATION OPERATION

The necessary guides, philosophies, and schedules were issued to management to actuate the year-end Salary Review. It is anticipated that all necessary work preliminary to the HAPO General Manager's approval will be completed by December 20, 1957.

A study of position worth relationships between the various maintenance foreman positions in CPD and IPD was completed. Essentially the study resulted in recommendations to maintain the status of these positions on an equal and "as is" basis.

A study and revision of the "Position Evaluation Guide" and "Instructions for Preparation of Position Guides" was participated in during the month. Additional work is yet to be done before issuance of these revisions.

The booklet "Salary Plan for Exempt Personnel" was distributed to all CPD exempt people during the month, to culminate the combined efforts of all HAPO departments development and printing of this brochure.

Four secretarial jobs were reviewed for merit promotional purposes and warranted promotional action was completed. Two clerical jobs were reviewed resulting in determination that no change should be made in either at this time.

A revised non-unit CPD job listing was prepared and issued to CPD management. In addition a CPD unit job listing and a listing by grades of all CPD non-exempt jobs was prepared for administrative use.

The administrative procedure for the application of the Secretarial Compensation Plan was revised, eliminating the management level factor and replacing this factor with other factors for each secretarial group. The revised procedure is in process of duplicating for issuance.

The 1957 Annual Northwest Area Survey Results have been received and are being analyzed relative to CPD classifications. Preliminary indications are that adjustment action upward is needed for some clerical classifications and possibly semi-technical. Otherwise all nonexempt rates with which CPD is concerned are in excess of area averages.

Administratively papers were processed as listed in the statistical portion of this report. All discrepancies incident thereto were handled with supervision concerned.

<u>ADDITIONS TO ROLL</u>	<u>Exempt</u>	<u>Nonexempt</u>
New Hires	0	0
Reactivations	0	2
Transfers from Other Departments		14
Reassignments from Exempt to Nonexempt		4
Reassignments from Nonexempt to Exempt	2	

<u>REDUCTIONS FROM ROLL</u>		
Terminations		2
R.O.F.		5
Deactivates and Leaves		8
Transfers to Other Departments or Divisions		17
Reassignments from Exempt to Nonexempt	4	
Reassignments from Nonexempt to Exempt		2

<u>CHANGE IN STATUS (NO SALARY CHANGE)</u>		
Intra-Departmental Transfers	9	47
Reassignments - Title Change	6	
Level Changes - Increase		
Level Changes - Decrease		
Location Change	4	

<u>CHANGE IN SALARY</u>		
Promotions	0	13
Demotions	0	6
Merits (Salary Review)	16	
Merits - Interim	1	
Automatics		17
Temporary-Reclassification		6
Salary Adjustments		1

REQUISITIONS 8

<u>SUGGESTION PLAN</u>	<u>OCTOBER</u>	<u>NOVEMBER</u>
Suggestions Received	38	48
Acknowledgments to Suggestors	49	43
Suggestions Pending Acknowledgment	4	9
Suggestions Referred to Operations for Investigation	9	43
Suggestions Pending Referral to Operations	4	9
Investigations Completed and Closed	52	24
Adopted Suggestions Approved by Board	0	111*
Adopted Suggestions Pending Approval by Board	75	8
Total Net Tangible Savings	0	0
Total Cash Awards Paid during Month	0	0

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\*Checks are currently being issued for distribution during December for \$4832.50 in awards with tangible annual savings of \$42,396.09. With the distribution of these checks the total awards for 1957 will reach \$14,443.00 with savings of \$133,841.90. The above payments will pay off all suggestions which have been approved by the Board with the exception of 4 which were approved in November and of which 2 are currently at Financial for audit. This will make CPD's average award on 494 adopted suggestions \$24.09 and the ratio of awards to savings will be 13.8%, both within the criteria established by the A.E.C. In addition to the 494 listed above, there were 3 other adoptions which do not count against the criteria but which have been counted in the total dollars of awards and total annual savings.

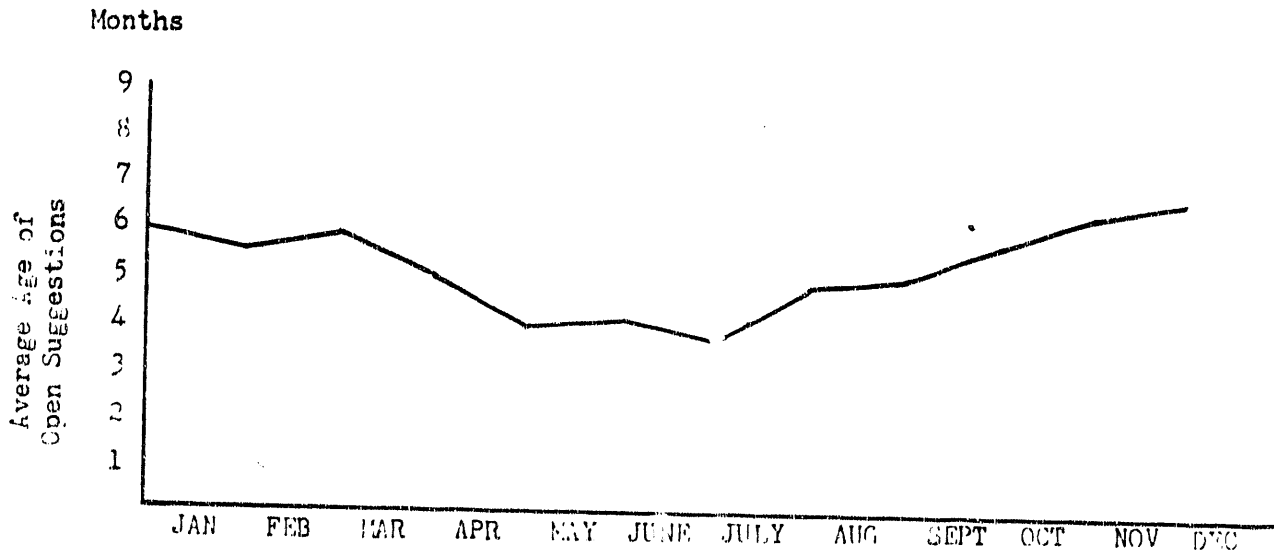
Total number of suggestions outstanding to operations at the end of the month:

OCTOBER

NOVEMBER

156

151



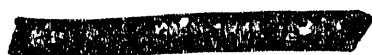
PARTICIPATION IN BENEFIT PLANS

OCTOBER

NOVEMBER

Insurance Plan	99.7	99.7
Pension Plan	99.2	99.7
Stock Bonus Plan	56.9	57.2
Good Neighbor Fund	63.5	61.7

Two General Managers Information Meetings were held during November with a total of 47 supervisory, exempt and Chief Operators in attendance.



During November one CPD employee who has been off work due to personal illness for nearly a year accepted Optional Retirement effective November 1, 1957. All matters regarding his retirement and his status in the Insurance Plan were discussed with him.

The Report to Employees on the Attitude Survey was distributed to all employees on November 6, 1957. An advance copy was distributed to all exempt employees on November 4th and 5th. To date 24 Sensitivity Survey forms have been returned to this office.

MILITARY SERVICE RECORDS

- Our records now reveal that CPD has a total of 126 employees who are subject to military training through Selective Service or Armed Forces Reserve actions. They are categorized as follows:

	<u>Exempt</u>	<u>Nonexempt</u>
Ready Reserve	13	12
Standby Reserve	13	7
Non Veterans		
1A		11
2C	1	
3A	6	41
4F	8	2
1S		1
Selective Service		
1A	0	0
2A	<u>11</u>	<u>0</u>
	52	74
		<u>126</u>

2. Deferments

Deferments Requested (November)	0
Deferments Granted (November)	3
Deferment requests pending	2
Routine	2
Appeal	0

STATUS - PERSONNEL DEVELOPMENT PROGRAM FOR NONEXEMPT EMPLOYEES

<u>Month</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>Sept.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Total</u>
Number of appraisals scheduled	132	76	108	96	117	110	639
Number of delinquent as of 12/3/57	3	1	3	8	10	68	93

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PERSONNEL DEVELOPMENT AND PLACEMENT

<u>A. Employment</u>	<u>Exempt</u>	<u>Non-exempt</u>	<u>Total</u>
<u>Additions</u>	2	16	18
Reactivates	0	2	2
Transfers into CPD	0	14	14
Classification Change	2	0	2
<u>*Removals</u>	1	35	36
ROF	1	5	6
Retired	0	1	1
Deceased	0	1	1
Illness	0	7	7
Leave of Absence	0	2	2
Transfers out of CPD	0	14	14
Resigned	0	3	3
Classification Change	0	2	2

Requisitions for Personnel (Non-exempt)

Number on Hand 11/1/57	8
Number Received	8
Number Filled	10
Number on Hand 11/30/57	6

Requests for Transfer (Exempt)

Number on Hand 11/1/57	25
Number Received	0
Number Transferred	0
Number Closed Out	2
Number on Hand 11/30/57	23

Applications for Employment (Exempt)

Applications received during month	0
Hired	0
Applications on Hand 11/30/57	0
Open Requisitions	2

Service Pins

A Total of 16 pins were issued as follows:

10 Yrs. Service	7 Male	1 Female
5 Yrs. Service	8 Male	0 Female

\*While there was an actual count of 37 non-exempt removals during this period, two of these were "former deactivates - will not return" and are not shown in this month's report.

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Attendance Awards - Pass folders were issued to 22 persons for perfect attendance.

Sixteen inquiries in regard to credit references, records of employees, or other aspects of employment for CPD employees were answered during the month.

During November GPD, IPD, R&U, and FPD coordinated their excess personnel so that ROF notices, downgrades, and transfers could be made effective November 8. The net result of these coordinated moves was that five CPD people were removed from the roll due to lack of work. Of these five, three ROFs were the direct result of CPD having junior personnel in various seniority groups who were "Bumped Out" by more senior employees. The other two, a General Clerk B in Financial Operation and a General Clerk C in Finished Products Operation were the direct result of reduction of force in CPD.

As indicated in previous reports, there has been an excess in the stenographic-secretarial category. This situation has been alleviated by transferring two excess secretaries to HLO and the voluntary termination of one steno-typist.

Two tests were given in November, they consisted of the Seashore Bennett Stenographic Proficiency Test for secretaries.

One exempt person on the available list was transferred to CEO on loan for four to six months and one reassigned within his own organization. One electrical foreman was placed on loan to IPD for a four to six month period.

B. Personnel Training and Development

Participation in Training Courses

Exempt Personnel	166
Non-exempt Personnel	59
G. E. Supervisory Selection Program-No. Completed	3
G. E. Supervisory Selection Program-Revaluation	3
Technical Graduates on Rotation	5
Technicians in Training	1
Employees counseled in self-development	7
Films Shown	1
OPGs Issued (Three new, Four revised)	7

Labor Management Conference #2, The Taft Hartley Act, was completed during November.

Dr. Conant started two new groups of "Understanding People".

The Data Processing Operation have revised their training schedule. The Engineering Session will be presented each month and the Commercial Session will be presented quarterly.

C. Office ServicesDuplicating

Total Copies Produced	168,056
Embosograf Signs Made	112
Verifax Copies Produced	299
Ozomatic Copies Produced	13,445

Mail

Total Pieces of Mail Handled	50,895
Registered Deliveries	264
Library Mail, Pounds	651

Addressograph

Instrument Charts Imprinted	8,608
Bulletins, OPGs, Etc.	4,819

Addressograph mailing lists have been set up for seven distribution lists:

- Level 2, 3, and 4 managers
- First line supervisors and foremen
- Exempt personnel
- OPGs and Advices
- Round Table
- Chief Operators
- Analytical lab group leaders

The lists are numbered from one to seven. In addition, a separate list has been composed containing a number of exempt and nonexempt personnel in order to meet the distribution of Financial Cost Code Books and Reports. Other lists will be added from time to time as required.

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HEALTH AND SAFETY OPERATION

<u>Chemical Processing Department</u>	<u>November</u>	<u>October</u>	<u>Year to Date</u>
Disabling Injuries	0	0	1
Serious Accidents	0	0	7
Medical Treatment Injuries	55	62	608
Overexposure Incidents	1	1	5
Potential Overexposure Incidents	0	0	3
Radiation Occurrences	37	31	314
Fires	2	1	17
Security Violations	2	2	29

Comments on Statistics

Of the 37 Radiation Occurrences, 5 were associated with the Redox shutdown and two with transfer of contaminated equipment.

The overexposure incident consisted of cumulative exposure to a Metal Finishing Operator exceeding the HAPO working limit of 3 r/year.

Property damage from the two fires was negligible. Contents of 202-A Brooks waste lugger ignited; broken exhaust pipe caused oil and wiring to burn on tractor truck.

Facilities Engineering Operation reported one unsecured repository; Production Operation reported improperly stored classified material.

Programs

The fourth quarter Safety Program, Elimination of Falls, was developed through the CPD Safety Program Council. Program for the remainder of 1957 consists of:

- 1) Prepared talks for use in Safety Meetings.
- 2) Posters, footsteps, pay check envelope messages.
- 3) Music and tape messages at badge houses.

Ten safety messages were posted on the marquee boards.

Arrangements were made for pre-selection and publicity of General Managers Award. (Eligibility date, December 6, 1957)

Safety calendars were requisitioned for all CPD people through each level three component to stimulate Home Safety in 1958.

Training and Education

Liaison was provided for the three Radiation Monitoring components in preparing a refresher training program scheduled for the first quarter of 1958.

The revised draft of the booklet "Radiation and Your Job" was reviewed and approved for CPD use.

Advice and Counsel

- Employee Relations - Task force work was continued on Industrial Medical Program; radiation work restriction policy; mosquito abatement problem; physical security controls.
- Redox - Follow-up on new oil storage, paint facility, cable room detection system.
- Purex - Grounding Argon cylinders; clean-up of Maintenance Hot Shop.
- Finished Products - Follow-up on additional fire protection - 234-5.
- Power and General Maintenance - Coal car unloading - 284-E.
- Facilities Engineering - Routine review of blueprints and projects.
- Hanford Laboratory Operation - Changes in pencil meter program; reduction of multiple permanent film badges; long range radiation protection problems.
- General - Radiation Monitoring responsibilities for construction work were relinquished by HLO and assumed by CPD effective November 15, 1957.

Inspection, Investigation and Audit

Audit of Finished products Metal Finishing and Product Recovery Operations was completed; report in progress.

Train crew pulled coal car from 284-E unloading pit with doors open and partial load; spread of coal on roadway derailed three cars west of 2704-E.

Reports

- CPD Overexposure Incident Investigation #57-4
- CPD Radiation Occurrences for September and October
- CPD Accident Prevention Council Minutes

UNION RELATIONS OPERATION

Three sessions of the Labor Relations Conference series were conducted during the month.

Eight grievances were processed at Step II during the month (including one non-unit grievance).

The Council's questioning of Company intent regarding annual exposure limits at 'Z' plant has been answered satisfactorily, at least for the present. A refinement of the method of measuring dosage was misunderstood by the Council.

The union has indicated intent to arbitrate a grievance concerning the transfer of a Power Chief Operator where he was not the junior man within the Department.

A non-unit grievance was filed by a Clerk 'C' who was laid off for lack of work. The grievant considered that she had been discriminated against because there were other individuals in the same classification at HAPO who had shorter continuity of service. It was explained that non-unit layoffs were made on a departmental basis rather than on a HAPO-wide basis. As a direct result of this grievance, however, a new policy was placed in effect in Relations and Utilities whereby a list of names of non-unit individuals in layoff status from all departments would be maintained. Individuals on the list will be considered for recall before anyone is hired from the street to fill requisitions for the non-unit classifications.

	<u>November</u>	<u>October</u>
Bargaining Unit Employees in CPD	889	898
Bargaining Unit Employees Utilizing Check-off	599	599
Percentage of total Bargaining Unit Employees Utilizing Check-off	67.37	66.7

Following is the grievance statistics summary for the month of November, 1957:

	<u>Unit</u>	<u>Nonunit</u>
Grievances received year to date	137*	2
Grievances pending at Step II on 10-31-57	2	0
Grievances received during the month	13	1
Satisfactorily answered at Step I	3	0
Settled at Step I through expiration of 90-day time limit	1	0
Processed at Step II	8	0
Pending at Step II on 11-30-57	13	1
Pending at arbitration	1	0

\* Twenty-seven grievances pertaining to vacation scheduling were received in one lot and were processed at Step II as two grievances - one for Millwrights and one for Pipefitters.

DEPT. A...

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COMMUNICATION

A. Statistics

GE NEWS items	11
Priority Messages	0
General Manager's meetings with exempt employees	2
Management News Bulletins	3
Employee News Letters	0
Employee Location Records mailed out	10
CPD FAMILY NEWS	0

B. Comments on Statistics

Eleven items were carried in the GE NEWS during the month. These included a picture of a CPD fireman in a Savings and Stock Bonus Plan feature; a Plant Panel participant; a promotion story and picture; four pictures of CPD people in a two-page spread on HAPO progress; a retirement picture; a safety meeting picture; a story and several pictures on the fourth quarter safety program; a picture of two CPD stock award winners; an obituary; an attendance award story; and a service award story.

The Acting General Manager was furnished with items for discussion submitted by the men who attended the Management Information meeting on November 7 and November 14.

C. Other Employee Communication Activities

The round table publication "Around the CPD Round Table" for December-January was prepared and duplicated and will be distributed the first week in December.

The layout and copy for the booklet, "Radiation and Your Job" was reviewed and approved for the second time, and returned to IPD for final assembly before being sent to the printer. Last minute changes in the copy by IPD RM personnel necessitated the second review and approval.

Arrangements were made with the Health and Safety Operation for the various publicity programs and communication techniques to be used during November and December in connection with the "Falls" Campaign.

At Office Services' request, the addressograph lists were reviewed and determined to be complete, with the addition of a lab technician list. Each list has been numbered in order to simplify list designation on duplicating orders.

Four, hour-long presentations on Communication were given to groups attending a supervisory training course conducted by the CPD Training Specialist.

Editorial assistance was given the Manager, Employee Compensation, in preparation of a transmittal letter for the Salary Plan booklet.

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D. Public Communication

A news release on a talk given by a CPD man at the Governor's Safety Conference was reviewed and approved.

Press Relations, R & U, has been requested to check with the Schenectady or New York Public Relations Offices about the possibility of having pictures taken of the McGraw-Hill Chemical Engineering Award presentation in New York in December. Press Relations has also been requested to check into the national publicity possibilities for an "I've Got A Secret" safety meeting held in CPD.

Four CPD authors requested counsel on clearance procedures during the month.

III. ORGANIZATION AND PERSONNEL

A. Meetings

Employee Relations personnel attended 85 meetings during the month. These included meetings with counterparts in other departments or operations to exchange information, to discuss the use of the new Salary Review Worksheet, and to pass along information obtained at the Communication Training Course in New York.

Six safety meetings were conducted for 150 Chemical Processing Department people by members of the Health and Safety Operation.

Four meetings of the Industrial Relations Council were held plus a Step II non-unit grievance meeting. Union Relations personnel attended Step II grievance meetings with the HAMTC.

A visit to CPD was made during the month by T. K. Koerner, Manager, Engineering Personnel Placement, Engineering Services and discussions were held with the managers of Facilities Engineering Operation and Research and Engineering Operation on CPD engineering problems and functions.

B. Personnel Training

Fire Protection Operation personnel participated in 65 inside drills and classes, and 36 outside drills; in which 5,320 feet of hose were used and 320 feet of ladders, for a total of 503 man-hours training. A smoke ejector was obtained from the Richland Fire Department and all CPD fire personnel were instructed on its operation and use.

C. Safety and Security

Two medical treatment injuries were reported, one by Fire Protection Operation and the other by Employee Compensation.

*D. S. Roberts*  
D. S. Roberts, Manager  
Employee Relations

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**END**

**DATE  
FILMED**

**9 / 16 / 92**